

UNR921xJ Series (UN921xJ Series)

Silicon NPN epitaxial planar type

For digital circuits

■ Features

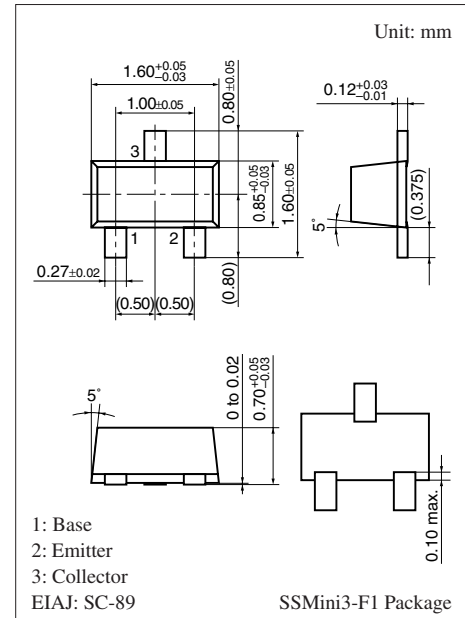
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts.
- SS-Mini type package, allowing automatic insertion through tape packing.

■ Resistance by Part Number

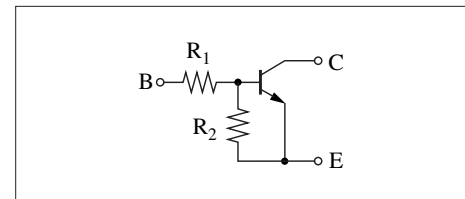
	Marking	Symbol	(R ₁)	(R ₂)
• UNR9210J (UN9210J)	8L		47 kΩ	—
• UNR9211J (UN9211J)	8A		10 kΩ	10 kΩ
• UNR9212J (UN9212J)	8B		22 kΩ	22 kΩ
• UNR9213J (UN9213J)	8C		47 kΩ	47 kΩ
• UNR9214J (UN9214J)	8D		10 kΩ	47 kΩ
• UNR9215J (UN9215J)	8E		10 kΩ	—
• UNR9216J (UN9216J)	8F		4.7 kΩ	—
• UNR9217J (UN9217J)	8H		22 kΩ	—
• UNR9218J (UN9218J)	8I		0.51 kΩ	5.1 kΩ
• UNR9219J (UN9219J)	8K		1 kΩ	10 kΩ
• UNR921AJ	8X		100 kΩ	100 kΩ
• UNR921BJ	8Y		100 kΩ	—
• UNR921CJ	8Z		—	47 kΩ
• UNR921DJ (UN921DJ)	8M		47 kΩ	10 kΩ
• UNR921EJ (UN921EJ)	8N		47 kΩ	22 kΩ
• UNR921FJ (UN921FJ)	8O		4.7 kΩ	10 kΩ
• UNR921KJ (UN921KJ)	8P		10 kΩ	4.7 kΩ
• UNR921LJ (UN921LJ)	8Q		4.7 kΩ	4.7 kΩ
• UNR921MJ	EL		2.2 kΩ	47 kΩ
• UNR921NJ	EX		4.7 kΩ	47 kΩ
• UNR921TJ (UN921TJ)	EZ		22 kΩ	47 kΩ
• UNR921VJ	FD		2.2 kΩ	2.2 kΩ

■ Absolute Maximum Ratings T_a = 25°C

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	V _{CBO}	50	V
Collector-emitter voltage (Base open)	V _{CEO}	50	V
Collector current	I _C	100	mA
Total power dissipation	P _T	125	mW
Junction temperature	T _j	125	°C
Storage temperature	T _{stg}	-55 to +125	°C



Internal Connection



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

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

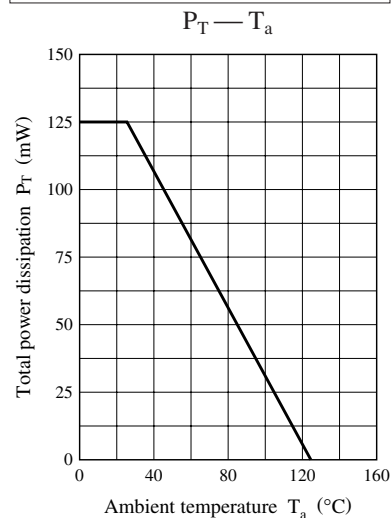
Parameter		Symbol	Conditions	Min	Typ	Max	Unit		
Collector-base voltage (Emitter open)		V_{CBO}	$I_C = 10 \mu\text{A}, I_E = 0$	50			V		
Collector-emitter voltage (Base open)		V_{CEO}	$I_C = 2 \text{ mA}, I_B = 0$	50			V		
Collector-base cut-off current (Emitter open)		I_{CBO}	$V_{CB} = 50 \text{ V}, I_E = 0$			0.1	μA		
Collector-emitter cut-off current (Base open)		I_{CEO}	$V_{CE} = 50 \text{ V}, I_B = 0$			0.5	μA		
Emitter-base cut-off current (Collector open)	UNR9210J/9215J/ 9216J/9217J/921BJ	I_{EBO}	$V_{EB} = 6 \text{ V}, I_C = 0$			0.01	mA		
	UNR9213J/921AJ					0.1			
	UNR9212J/9214J/921DJ/ 921EJ/921MJ/921NJ/921TJ					0.2			
	UNR9211J					0.5			
	UNR921FJ/921KJ					1.0			
	UNR9219J					1.5			
	UNR9218J/921CJ/921LJ/921VJ					2.0			
	Forward current transfer ratio			UNR921VJ	h_{FE}	$V_{CE} = 10 \text{ V}, I_C = 5 \text{ mA}$	6		20
UNR9218J/921KJ/921LJ		20							
UNR9219J/921DJ/921FJ		30							
UNR9211J		35							
UNR9212J/921EJ		60							
UNR9213J/9214J/921AJ/ 921CJ/921MJ		80							
UNR921NJ/921TJ		80		400					
UNR9210J/9215J/9216J/ 9217J/921BJ		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		
				UNR9213J/921BJ/921KJ	$V_{CC} = 5 \text{ V}, V_B = 3.5 \text{ V}, R_L = 1 \text{ k}\Omega$				
				UNR921DJ	$V_{CC} = 5 \text{ V}, V_B = 10 \text{ V}, R_L = 1 \text{ k}\Omega$				
				UNR921EJ	$V_{CC} = 5 \text{ V}, V_B = 6 \text{ V}, R_L = 1 \text{ k}\Omega$				
				UNR921AJ	$V_{CC} = 5 \text{ V}, V_B = 5 \text{ V}, R_L = 1 \text{ k}\Omega$				
Transition frequency		f_T	$V_{CB} = 10 \text{ V}, I_E = -2 \text{ mA}, f = 200 \text{ MHz}$		150		MHz		
Input resistance	UNR9218J	R_1		-30%	0.51	+30%	k Ω		
	UNR9219J				1				
	UNR921MJ/921VJ				2.2				
	UNR9216J/921FJ/921LJ/921NJ				4.7				
	UNR9211J/9214J/9215J/921KJ				10				
	UNR9212J/9217J/921TJ				22				
	UNR9210J/9213J/921DJ/921EJ				47				
	UNR921AJ/921BJ				100				

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

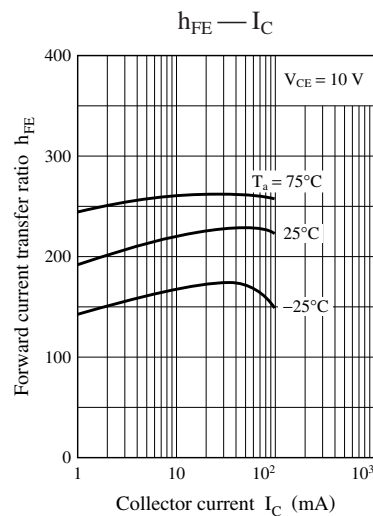
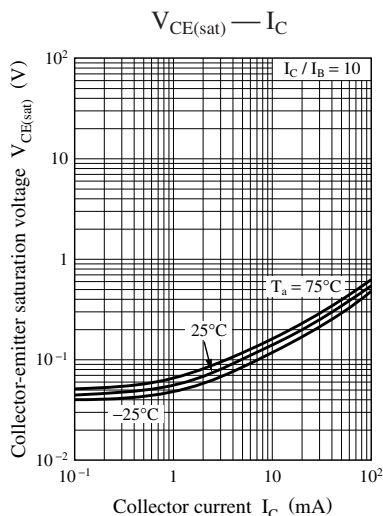
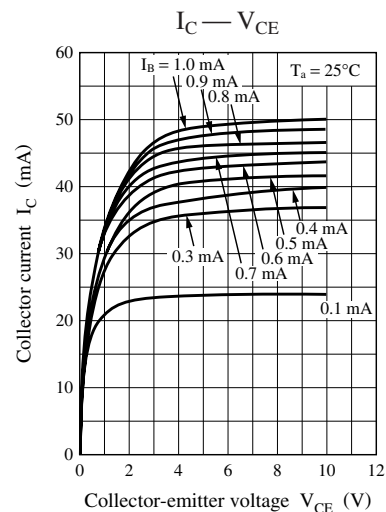
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Emitter-base resistance	UNR921CJ	R_2		-30%	47	+30%	$k\Omega$
Resistance ratio	UNR921MJ	R_1/R_2			0.047		—
	UNR921NJ				0.1		
	UNR9218J/9219J			0.08	0.10	0.12	
	UNR9214J			0.17	0.21	0.25	
	UNR921TJ				0.47		
	UNR921FJ			0.37	0.47	0.57	
	UNR921AJ/921VJ				1.0		
	UNR9211J/9212J/9213J/921LJ			0.8	1.0	1.2	
	UNR921KJ			1.70	2.13	2.60	
	UNR921EJ			1.70	2.14	2.60	
	UNR921DJ			3.7	4.7	5.7	

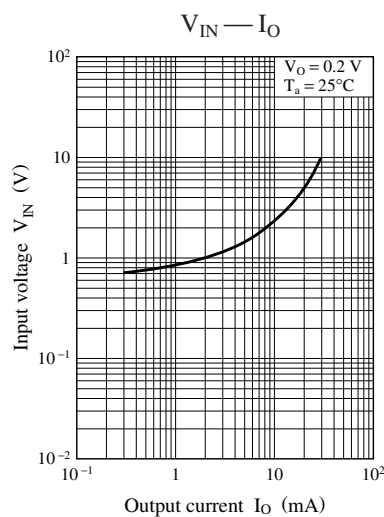
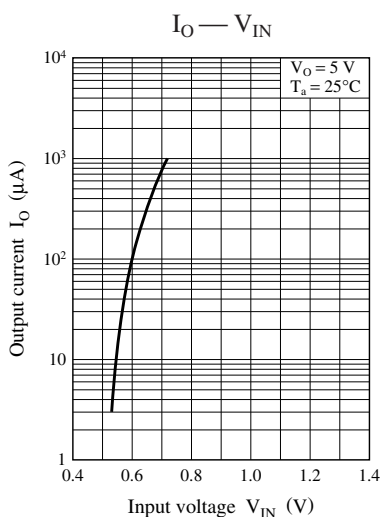
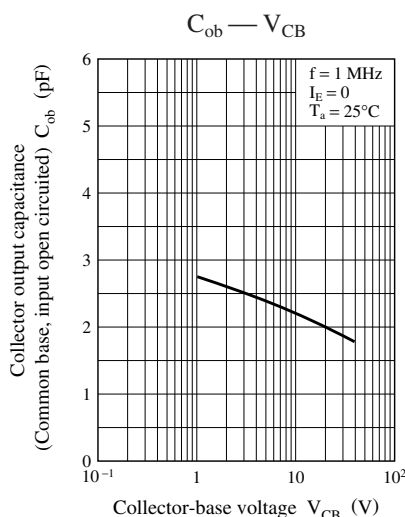
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

Common characteristics chart

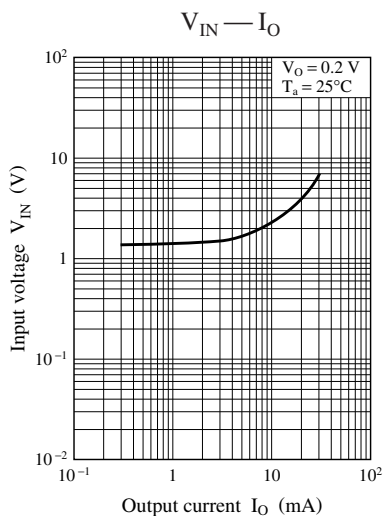
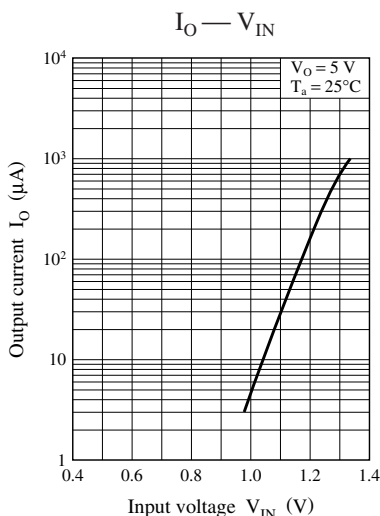
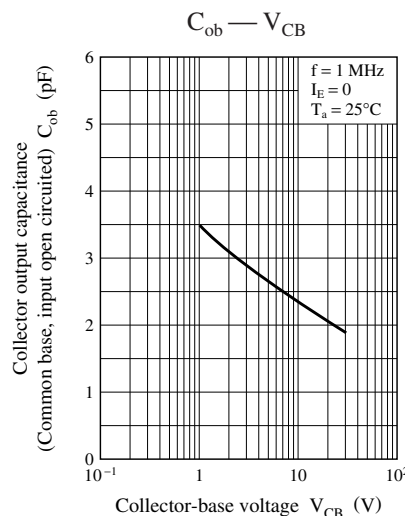
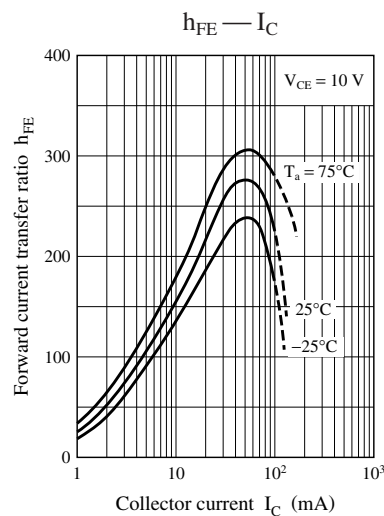
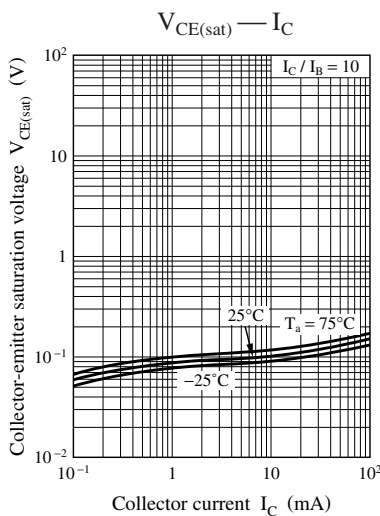
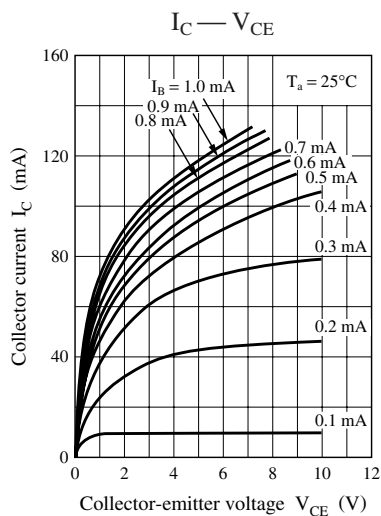


Characteristics charts of UNR9210J

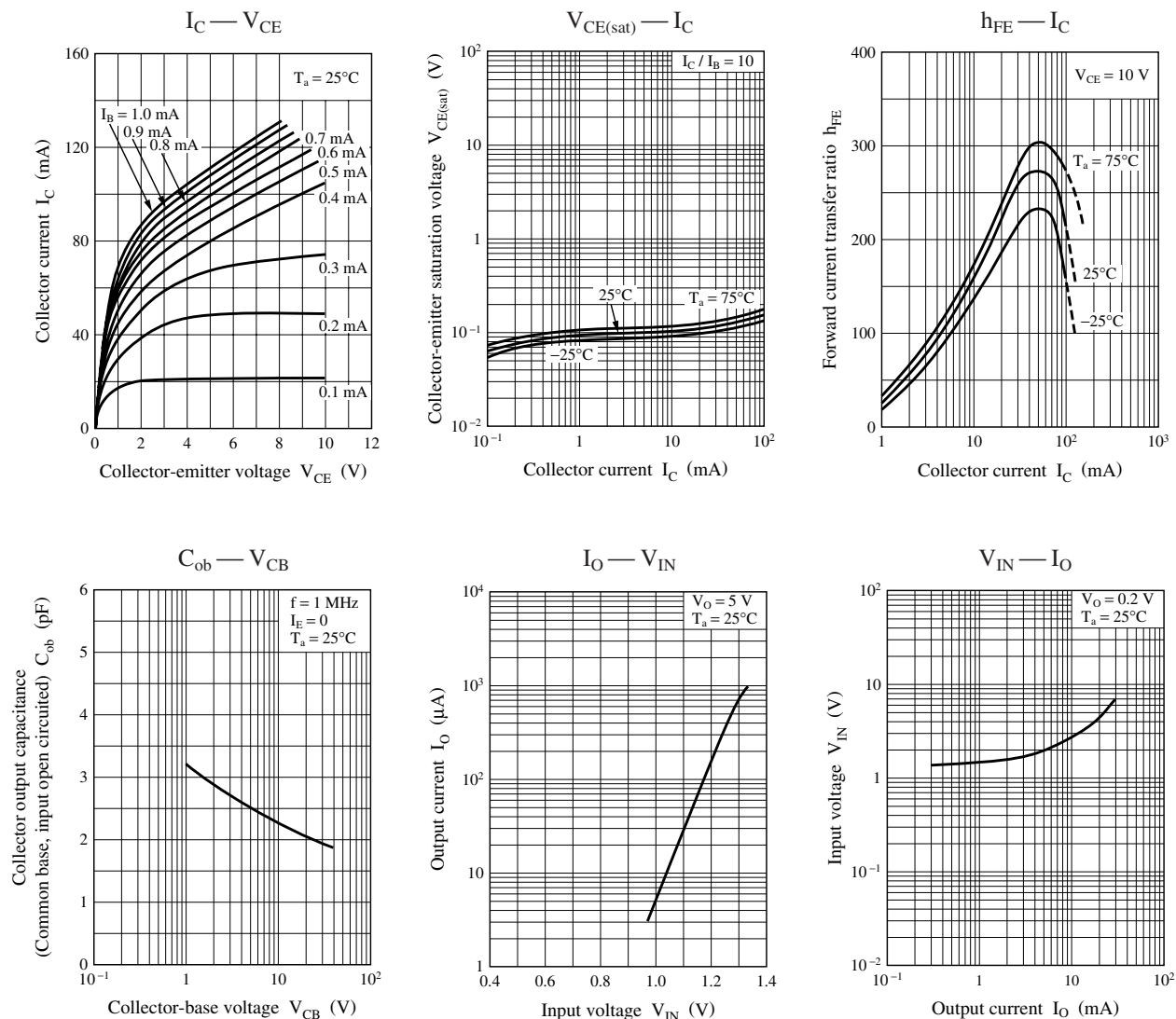




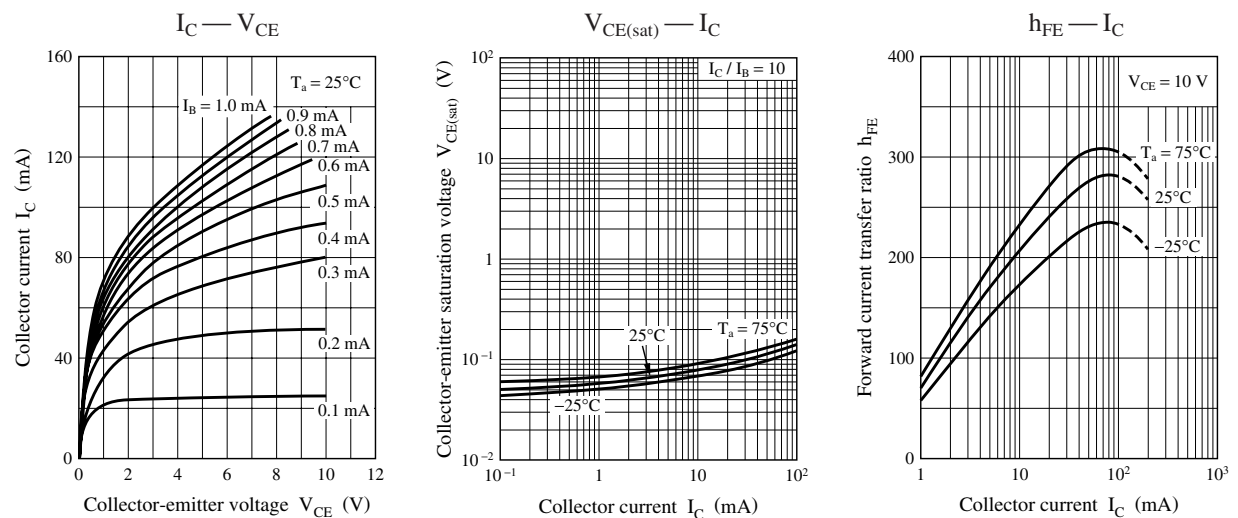
Characteristics charts of UNR9211J

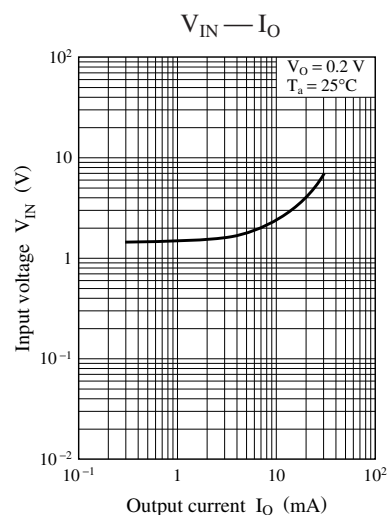
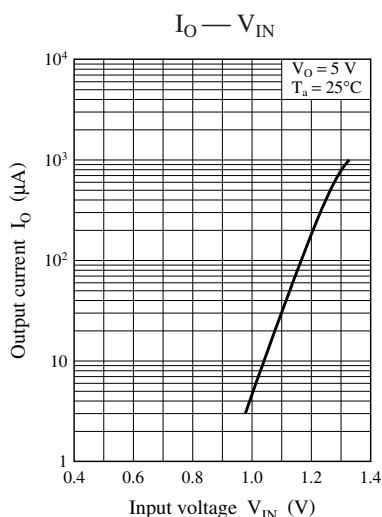
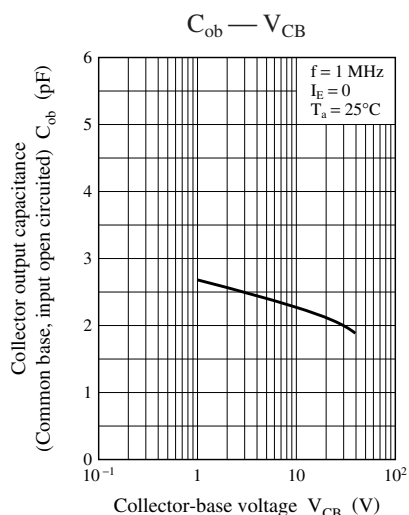


Characteristics charts of UNR9212J

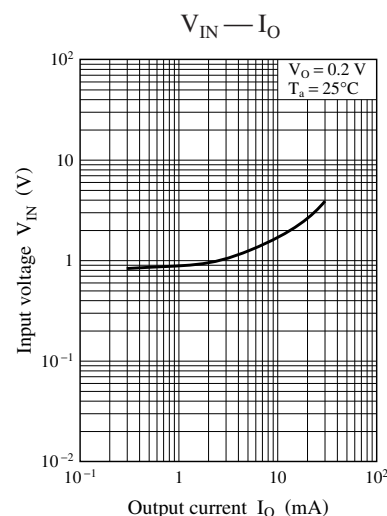
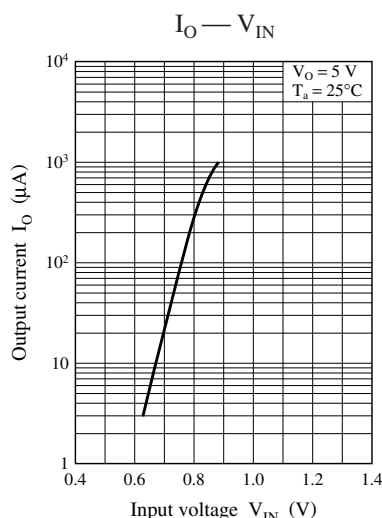
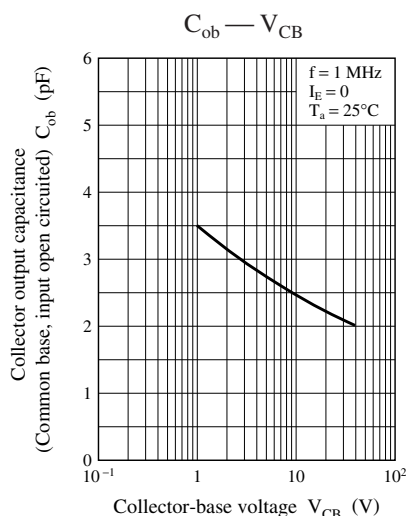
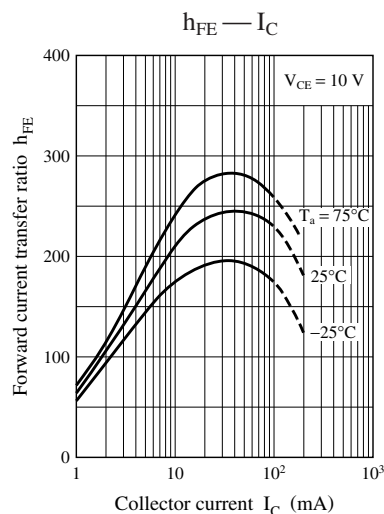
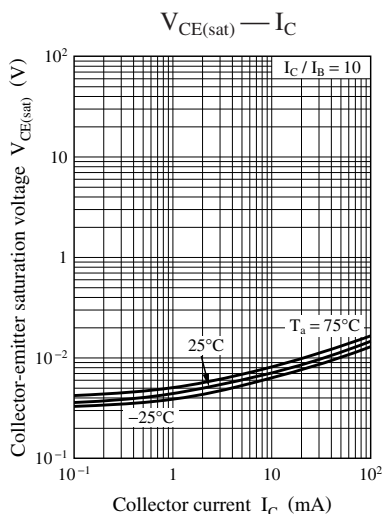
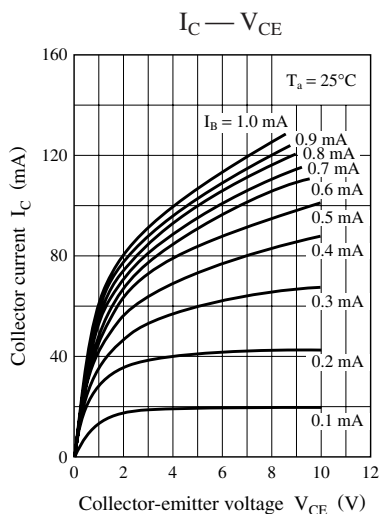


Characteristics charts of UNR9213J

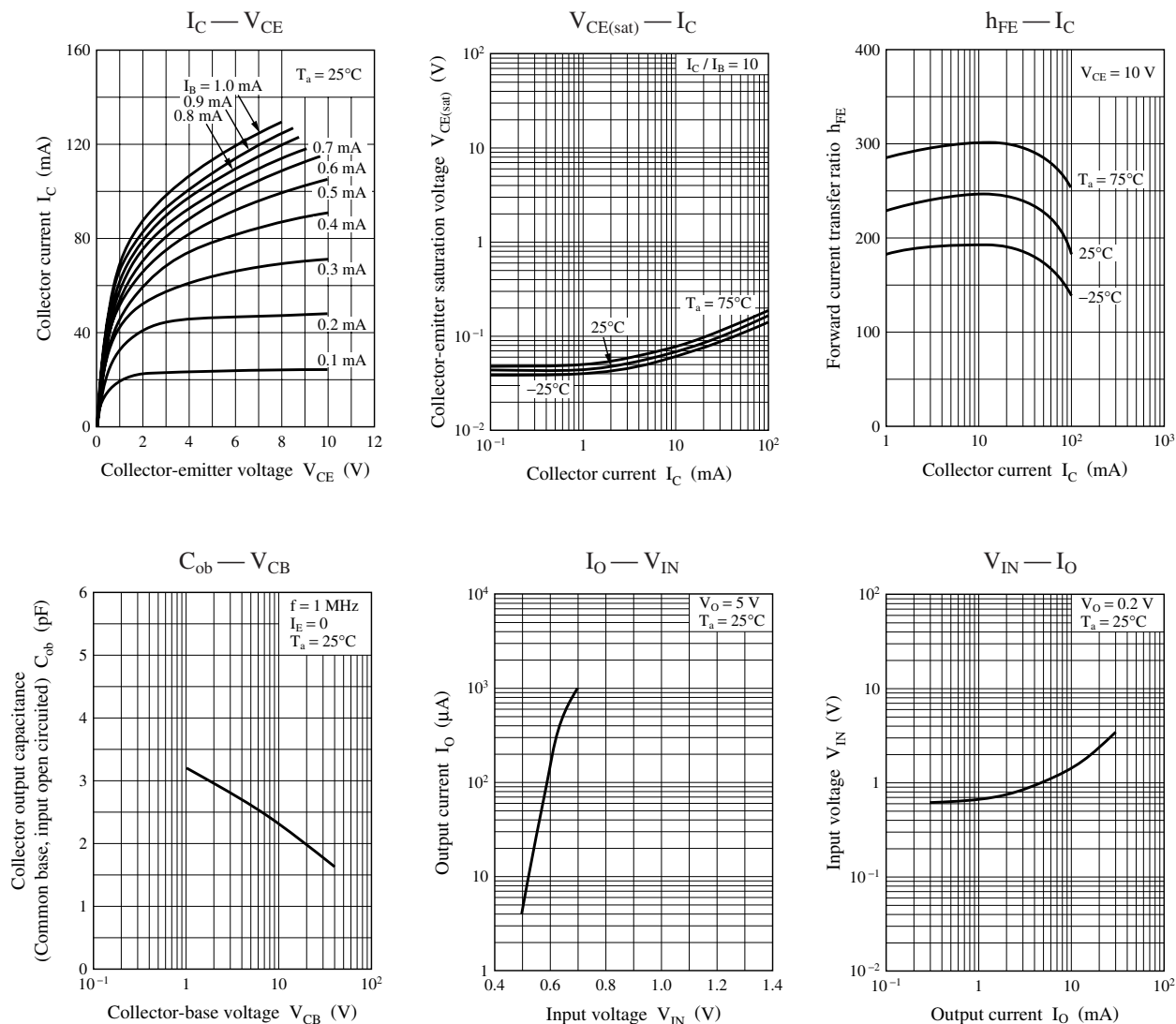




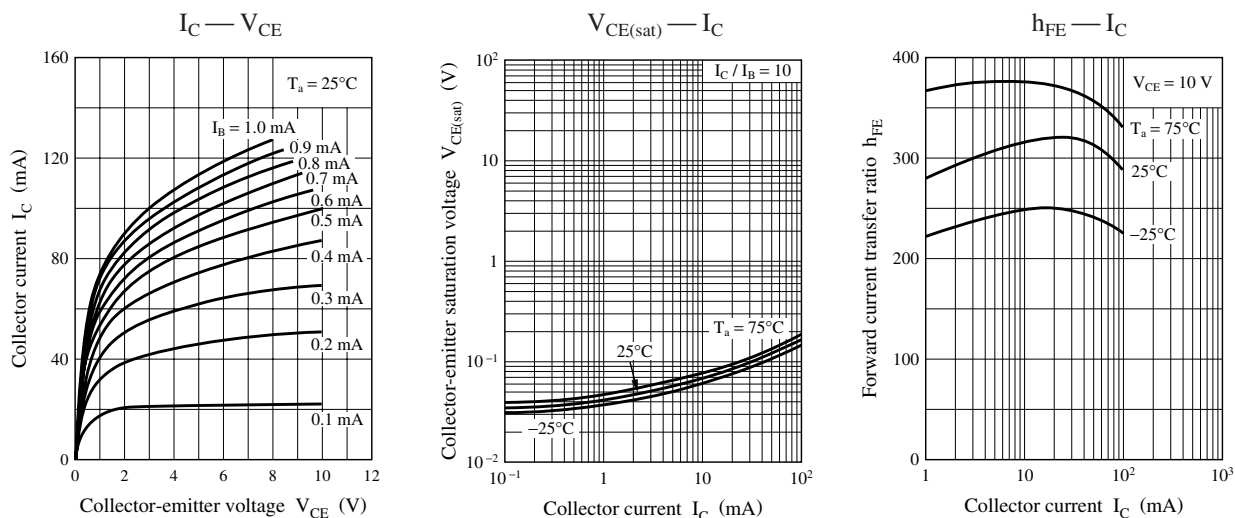
Characteristics charts of UNR9214J

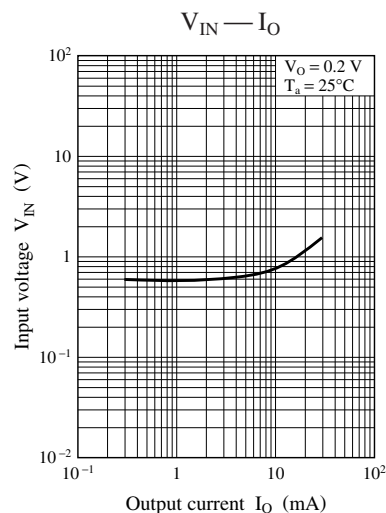
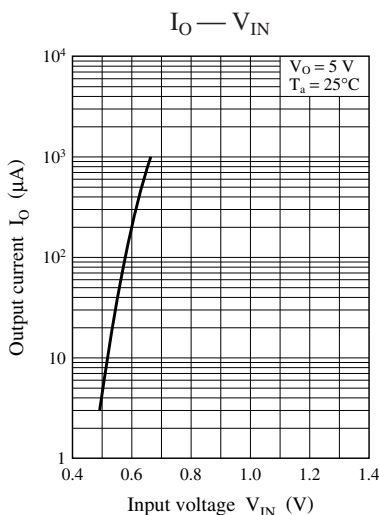
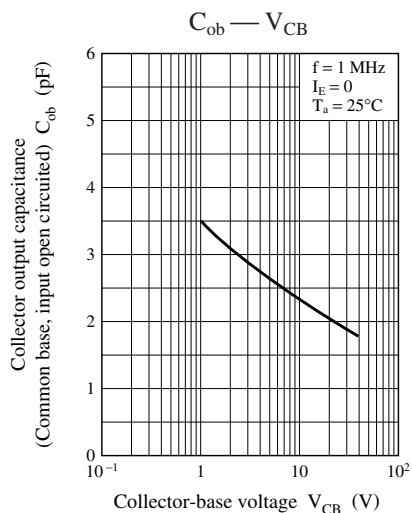


Characteristics charts of UNR9215J

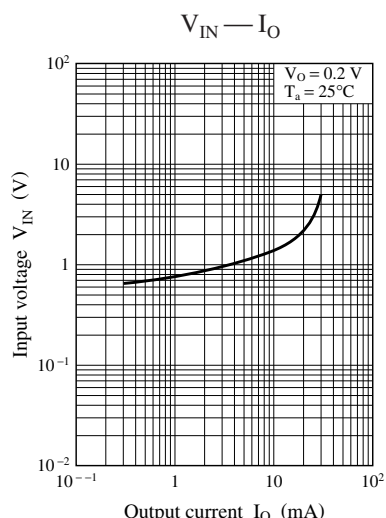
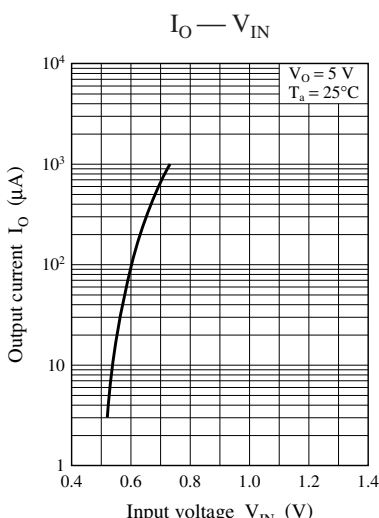
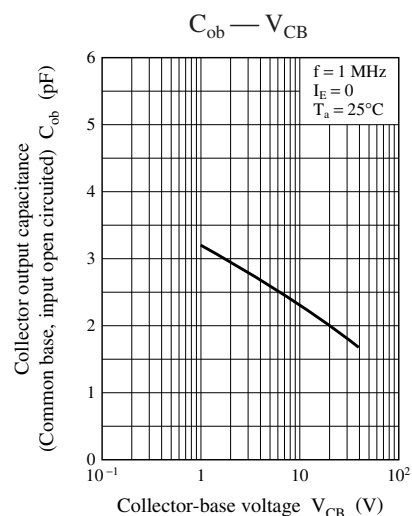
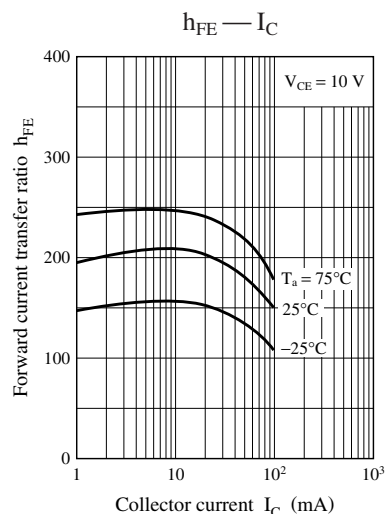
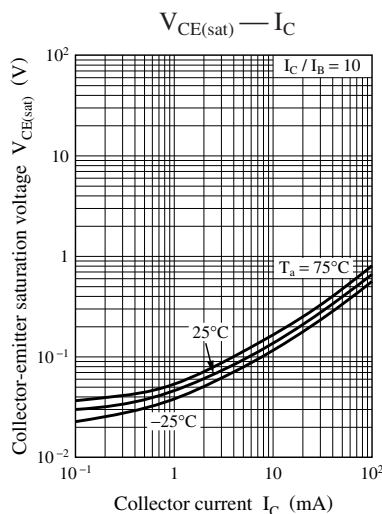
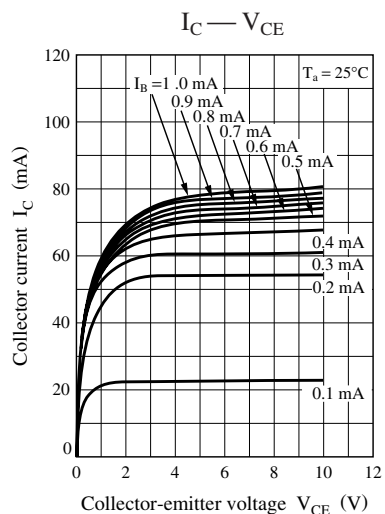


Characteristics charts of UNR9216J

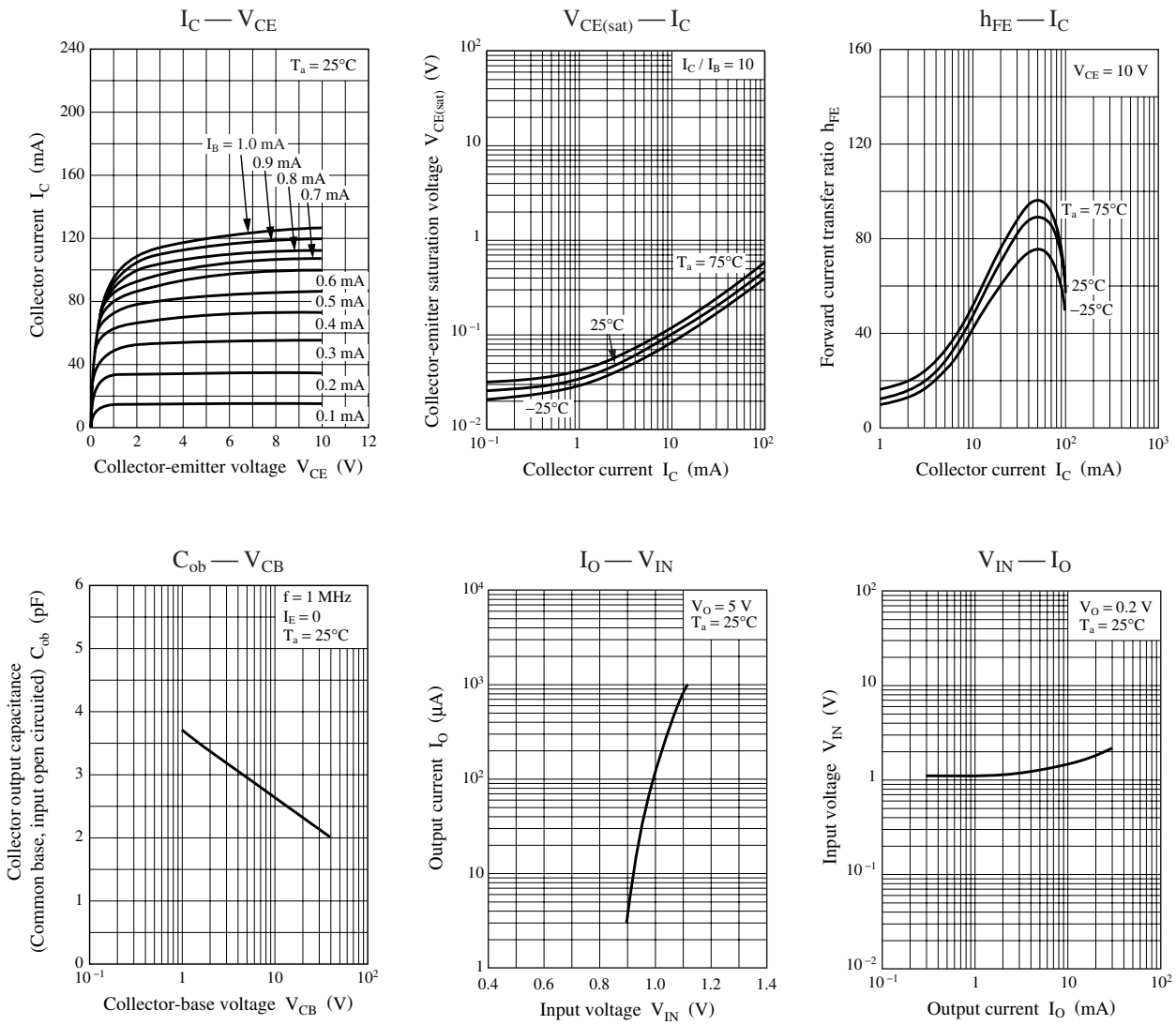




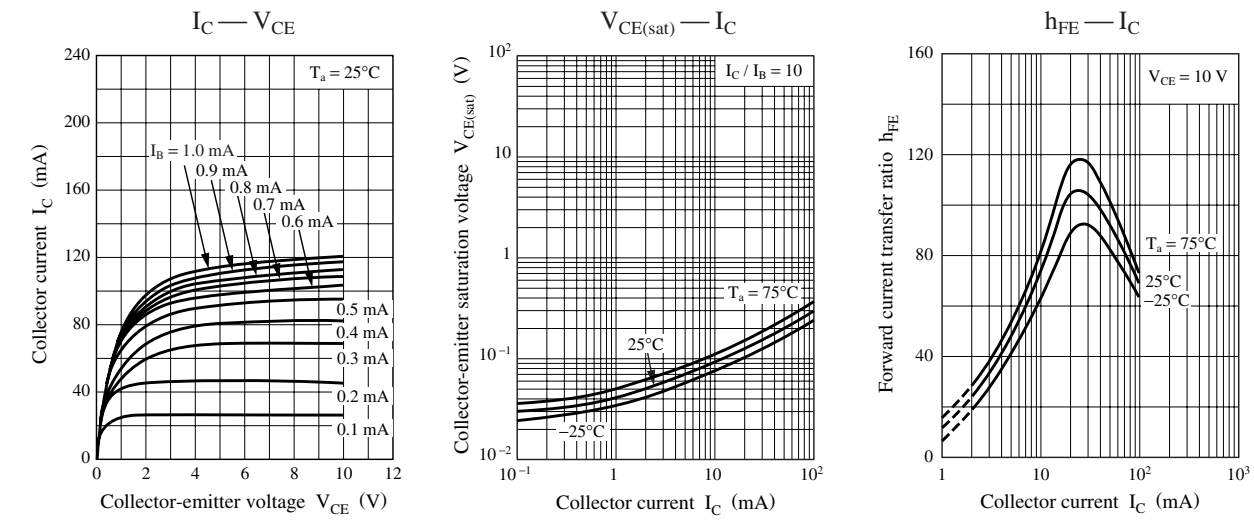
Characteristics charts of UNR9217J

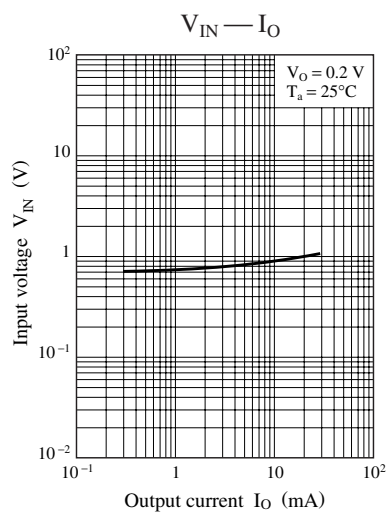
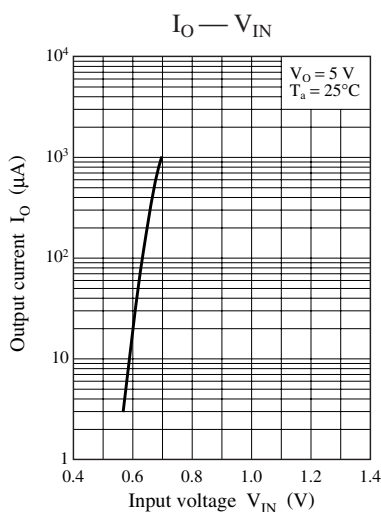
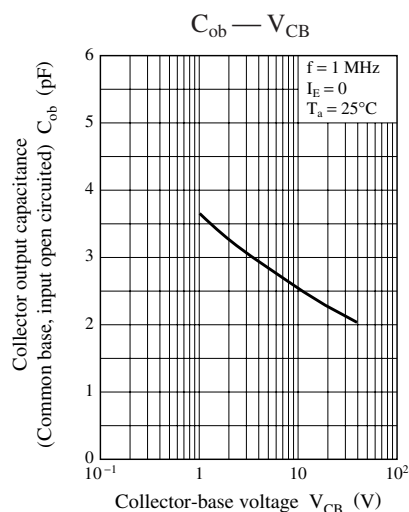


Characteristics charts of UNR9218J

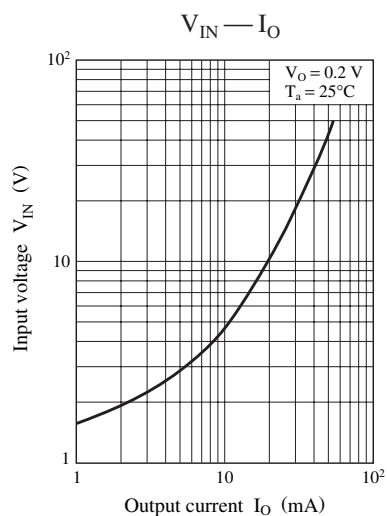
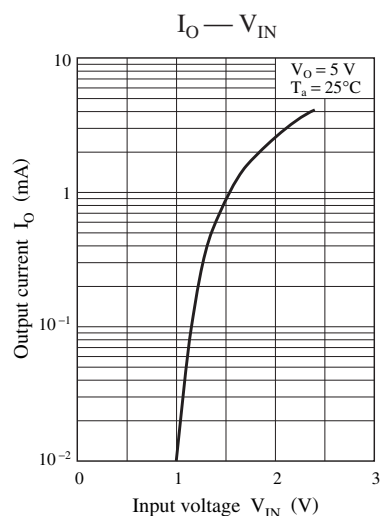
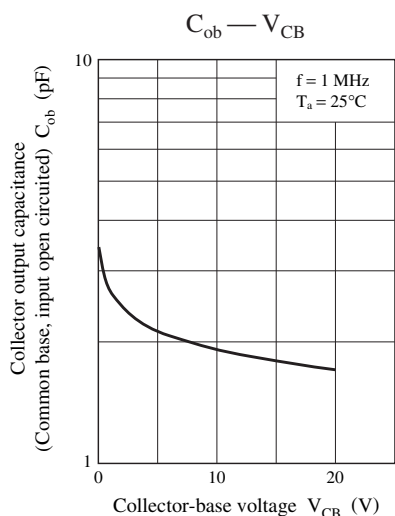
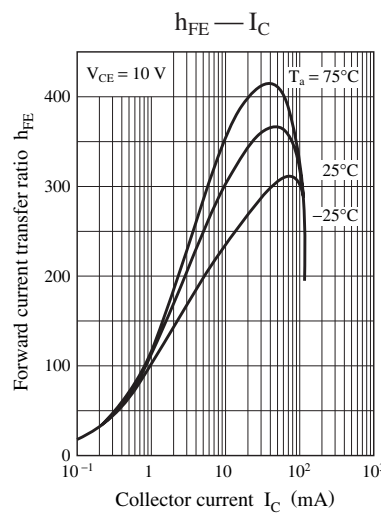
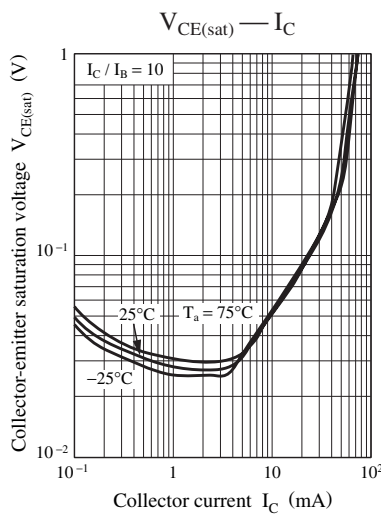
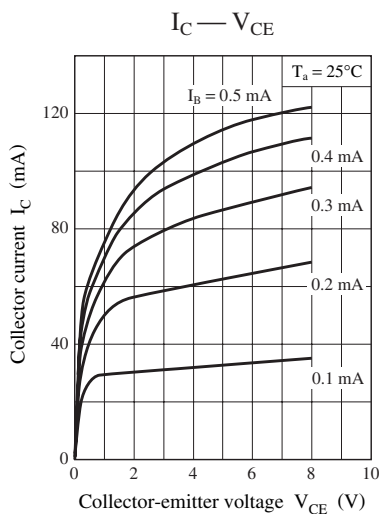


Characteristics charts of UNR9219J

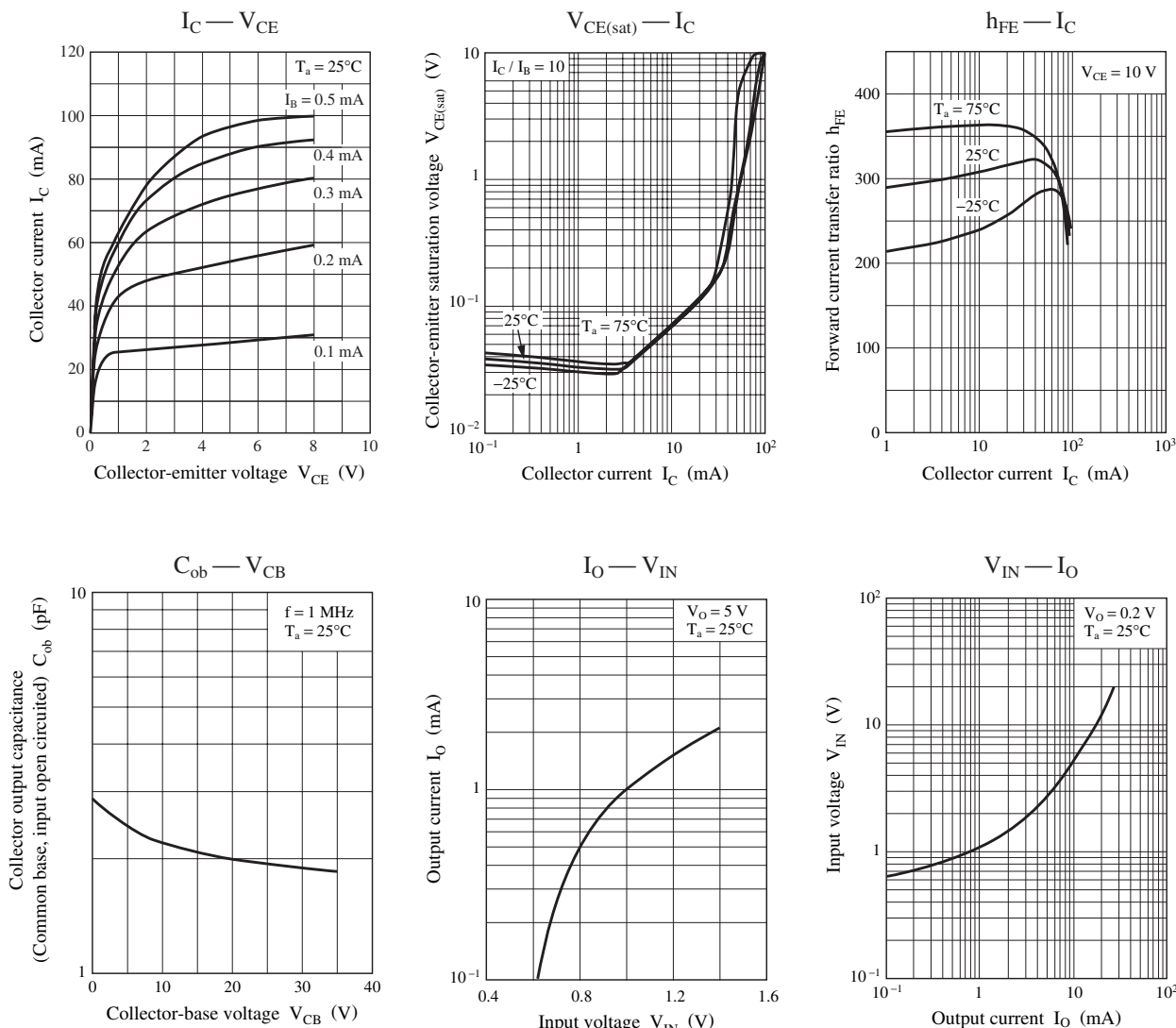




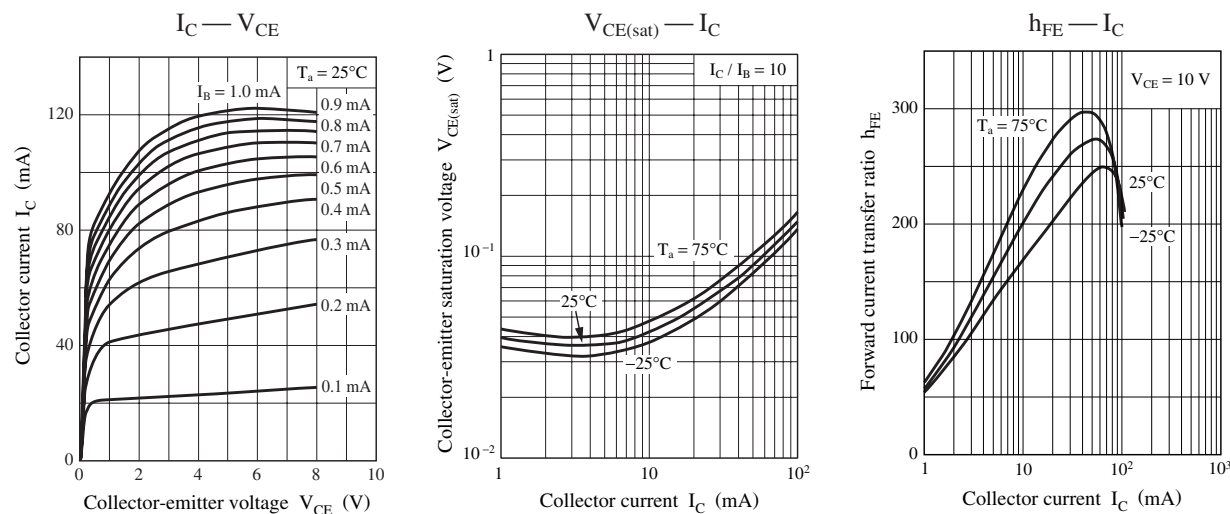
Characteristics charts of UNR921AJ

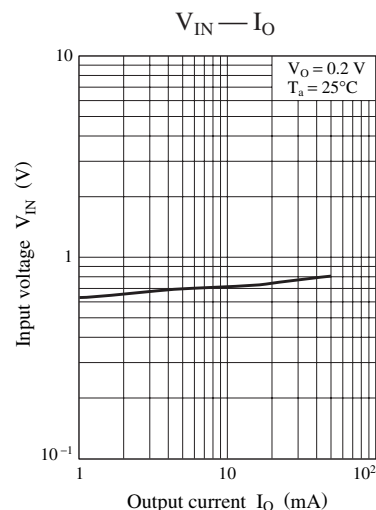
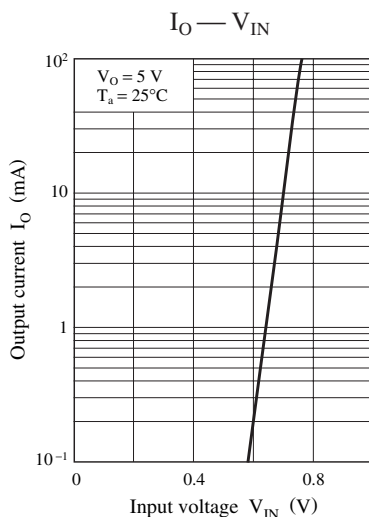
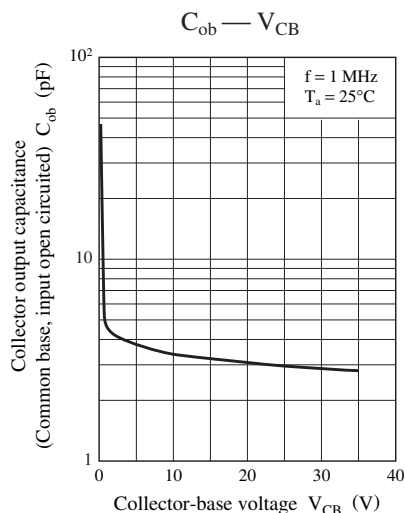


Characteristics charts of UNR921BJ

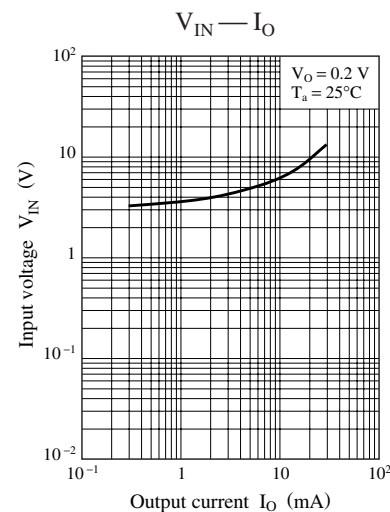
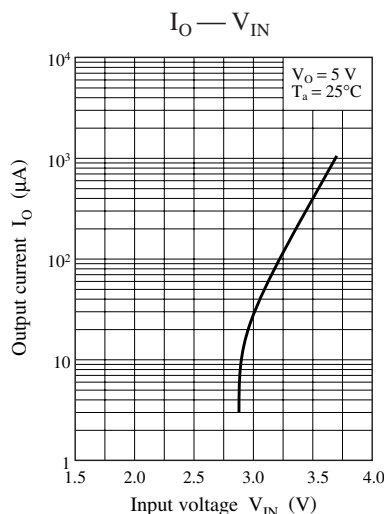
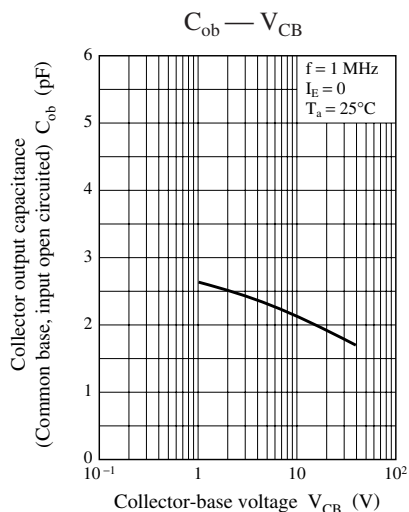
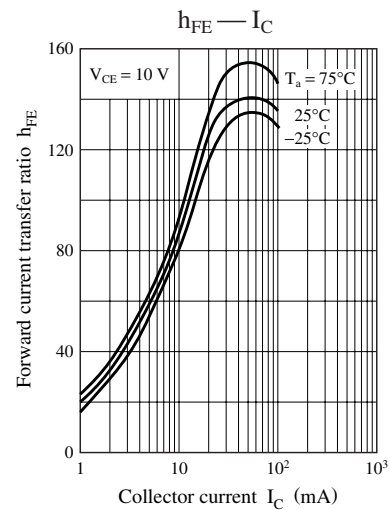
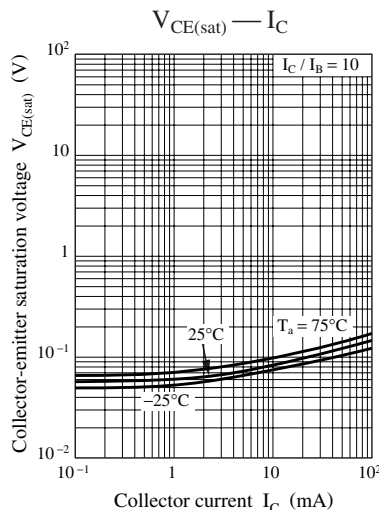
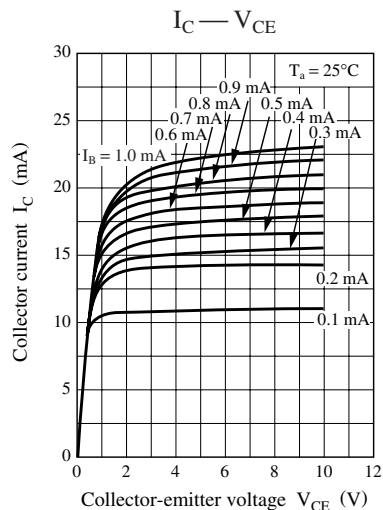


Characteristics charts of UNR921CJ

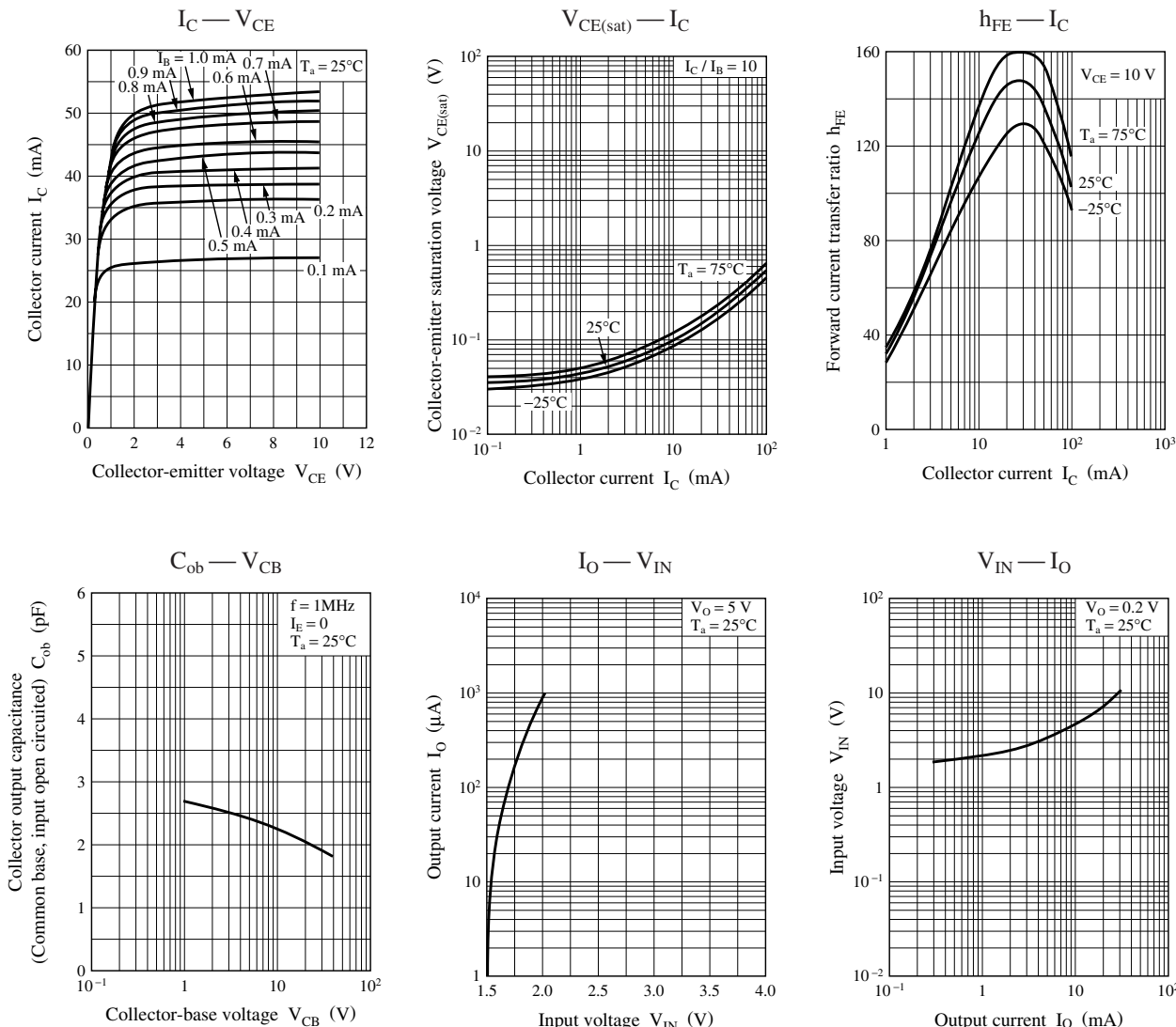




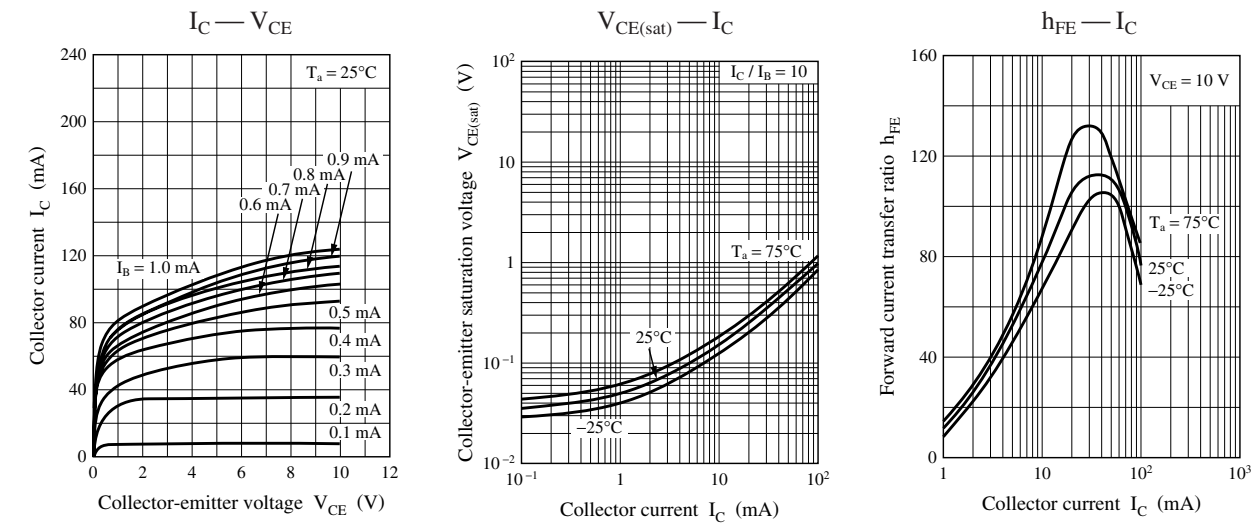
Characteristics charts of UNR921DJ

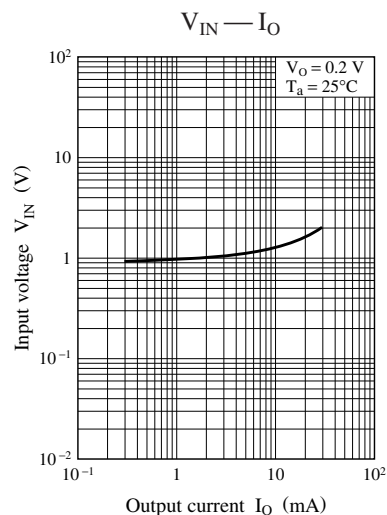
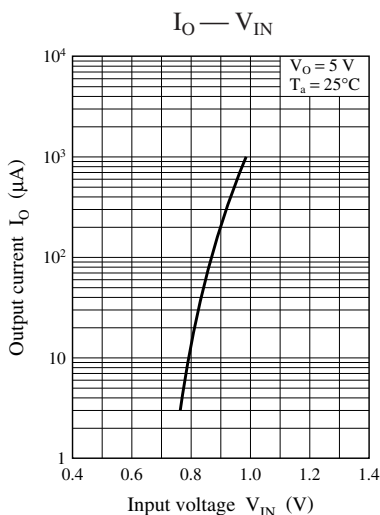
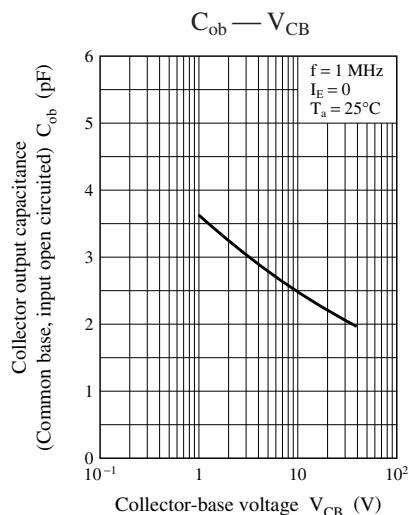


Characteristics charts of UNR921EJ

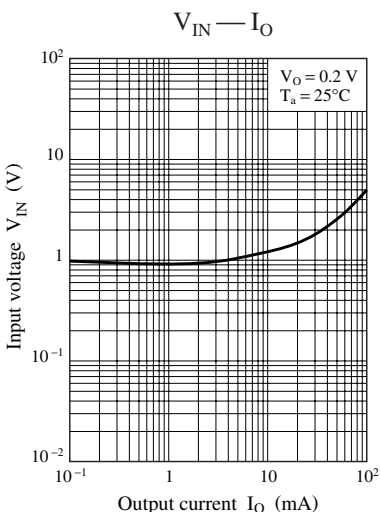
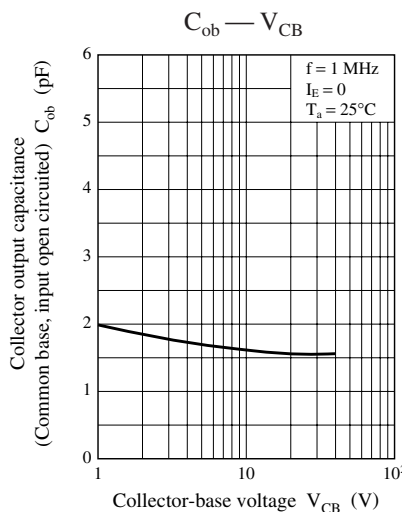
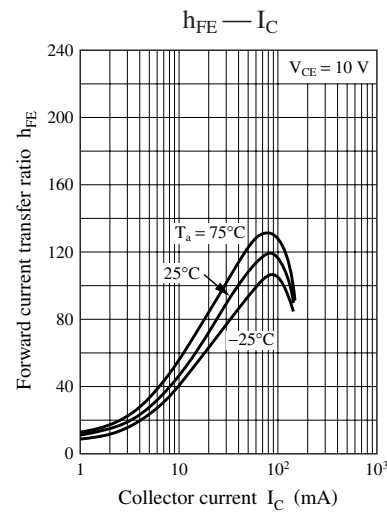
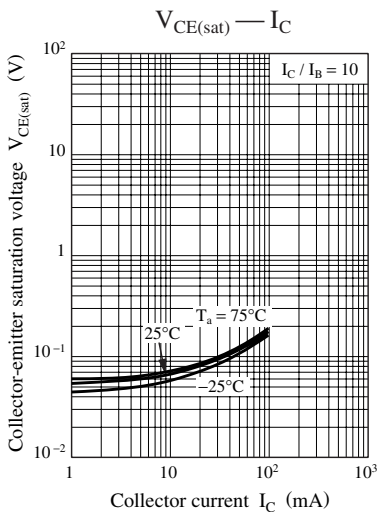
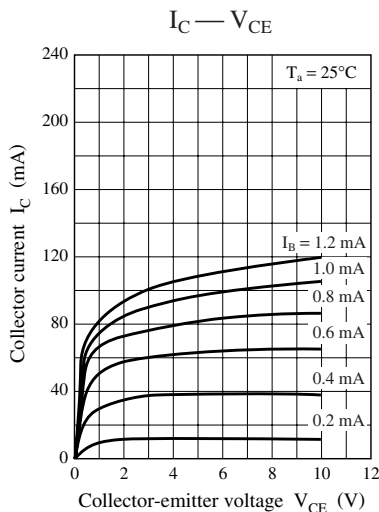


Characteristics charts of UNR921FJ

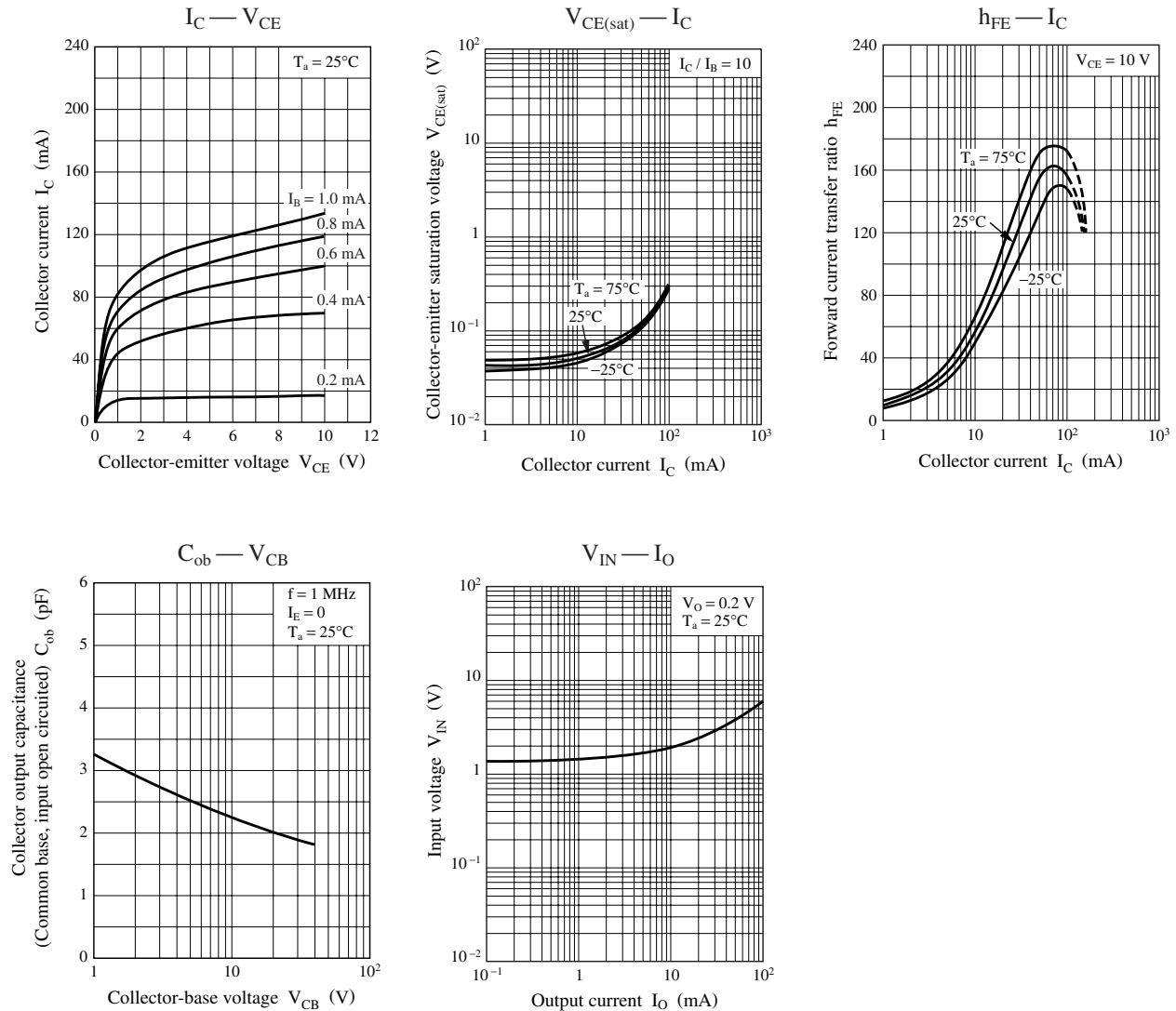




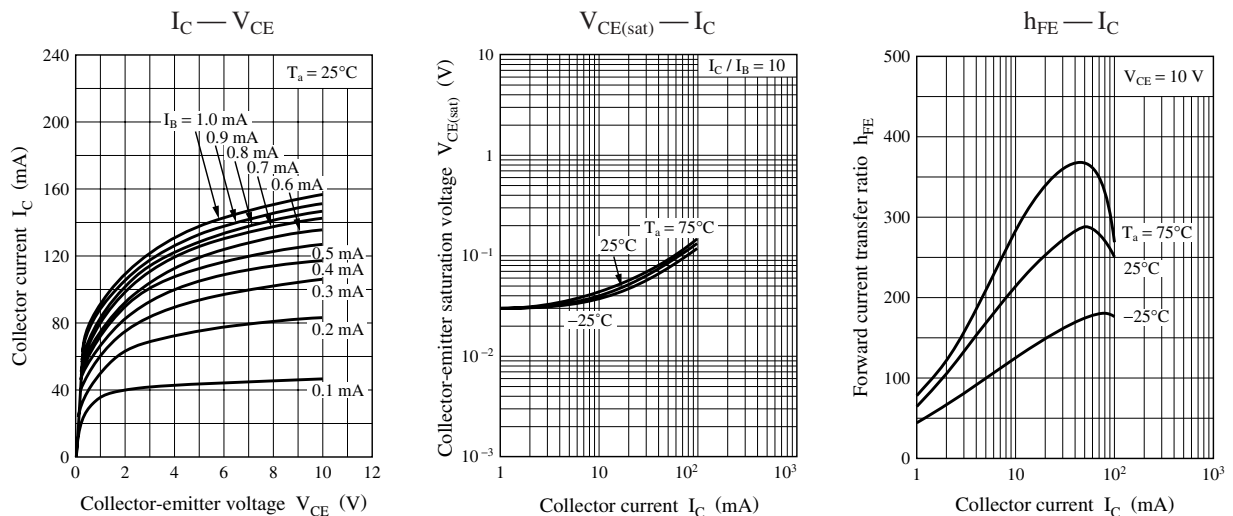
Characteristics charts of UNR921KJ

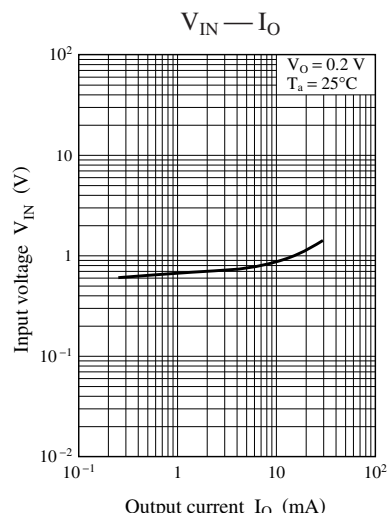
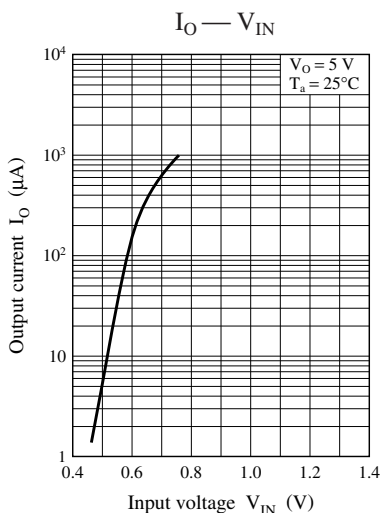
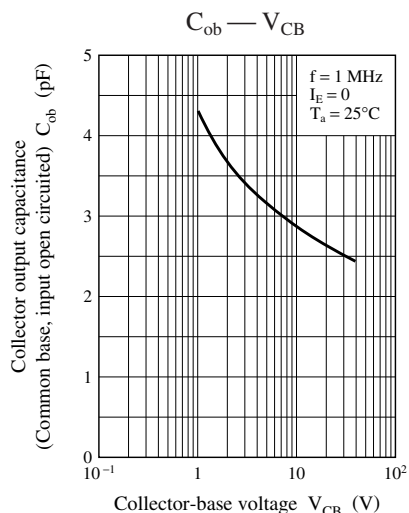


Characteristics charts of UNR921LJ

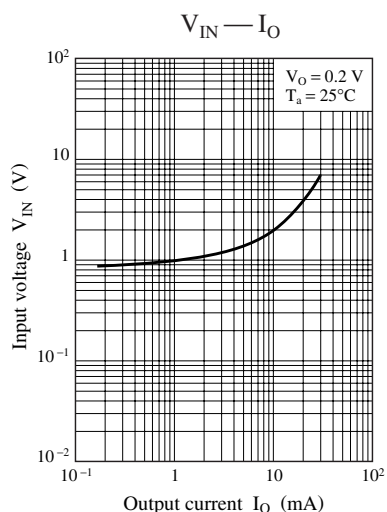
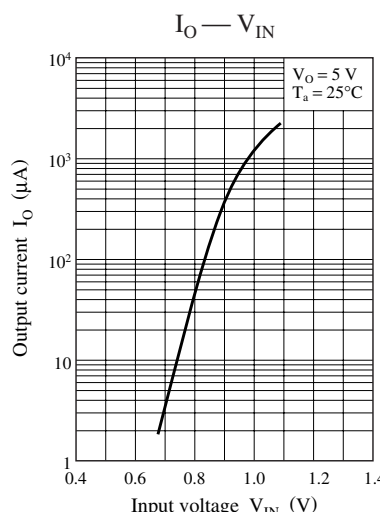
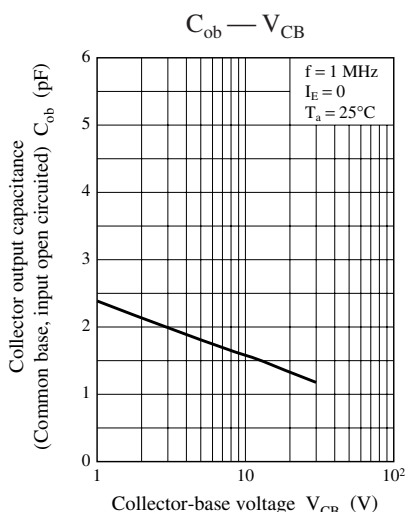
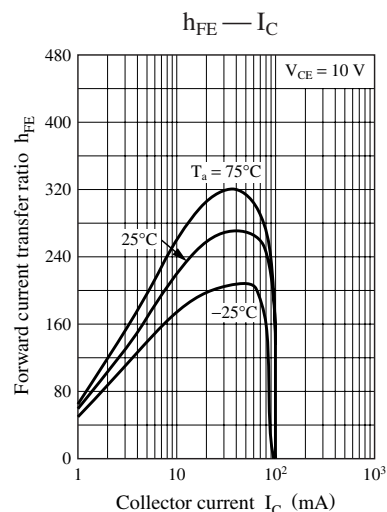
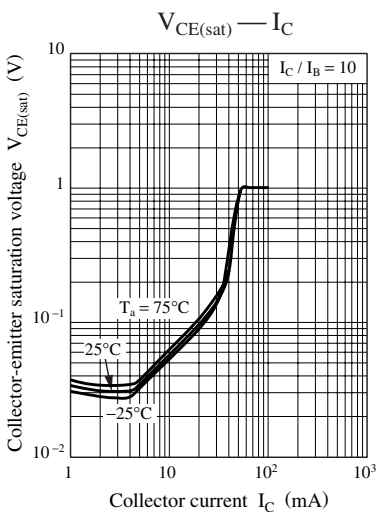
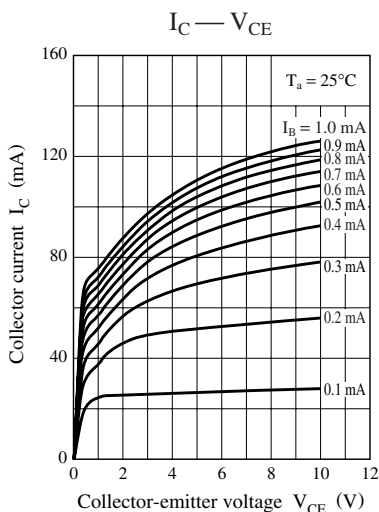


Characteristics charts of UNR921MJ

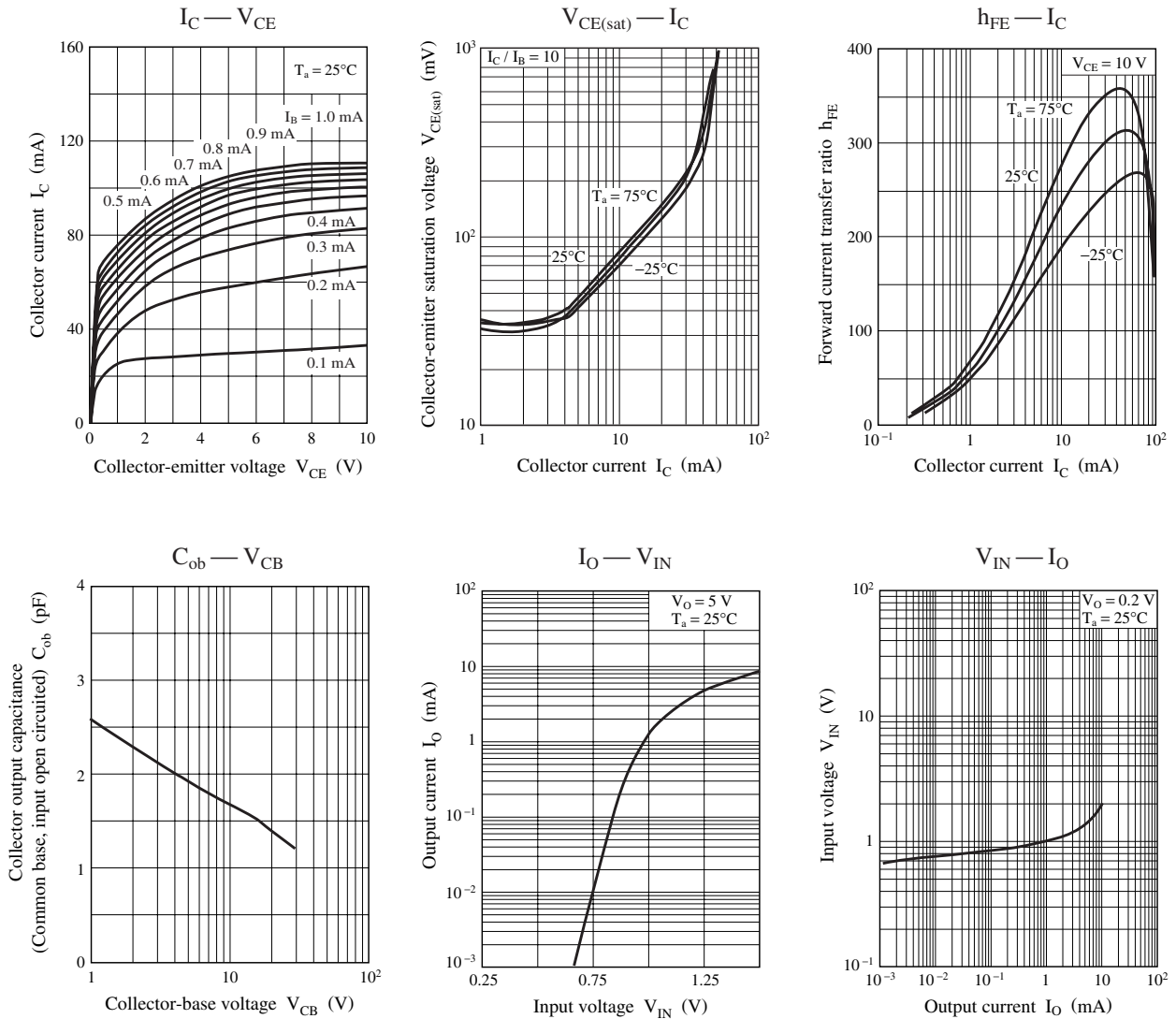




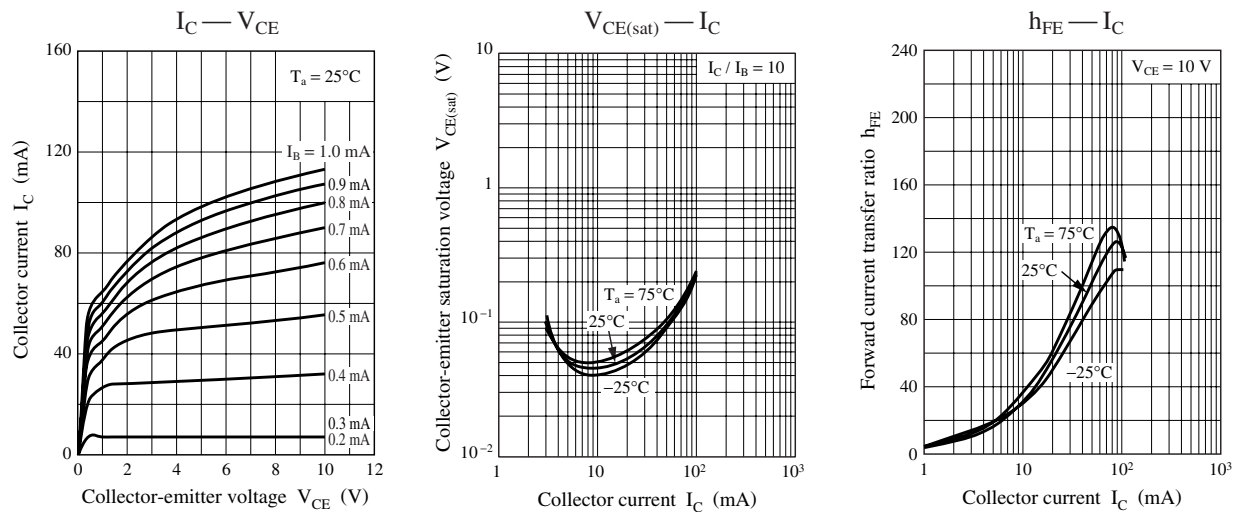
Characteristics charts of UNR921NJ

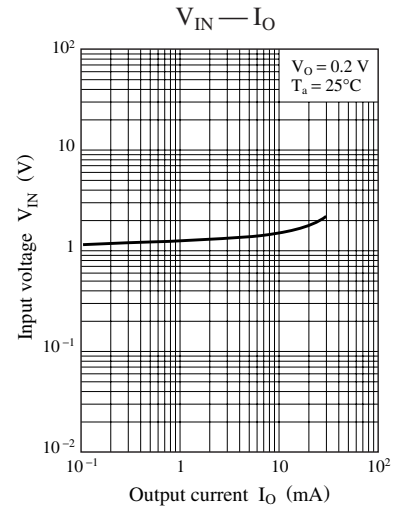
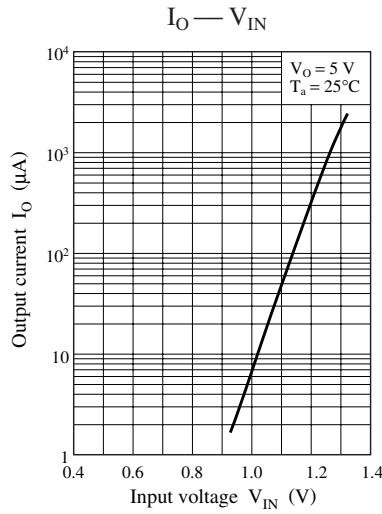
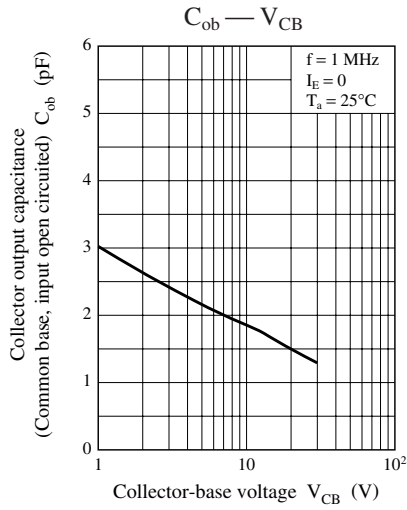


Characteristics charts of UNR921TJ



Characteristics charts of UNR921VJ





Request for your special attention and precautions in using the technical information and semiconductors described in this material

- (1) An export permit needs to be obtained from the competent authorities of the Japanese Government if any of the products or technical information described in this material and controlled under the "Foreign Exchange and Foreign Trade Law" is to be exported or taken out of Japan.
- (2) The technical information described in this material is limited to showing representative characteristics and applied circuits examples of the products. It neither warrants non-infringement of intellectual property right or any other rights owned by our company or a third party, nor grants any license.
- (3) We are not liable for the infringement of rights owned by a third party arising out of the use of the technical information as described in this material.
- (4) The products described in this material are intended to be used for standard applications or general electronic equipment (such as office equipment, communications equipment, measuring instruments and household appliances).
Consult our sales staff in advance for information on the following applications:
 - Special applications (such as for airplanes, aerospace, automobiles, traffic control equipment, combustion equipment, life support systems and safety devices) in which exceptional quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or harm the human body.
 - Any applications other than the standard applications intended.
- (5) The products and product specifications described in this material 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.
- (6) When designing your equipment, comply with the guaranteed values, in particular those of maximum rating, the range of operating power supply voltage, and heat radiation characteristics. 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.
- (7) When using products for which damp-proof packing is required, observe the conditions (including shelf life and amount of time let standing of unsealed items) agreed upon when specification sheets are individually exchanged.
- (8) This material may be not reprinted or reproduced whether wholly or partially, without the prior written permission of Matsushita Electric Industrial Co., Ltd.