

UNR211x Series (UN211x Series)

Silicon PNP epitaxial planar type

For digital circuits

■ Features

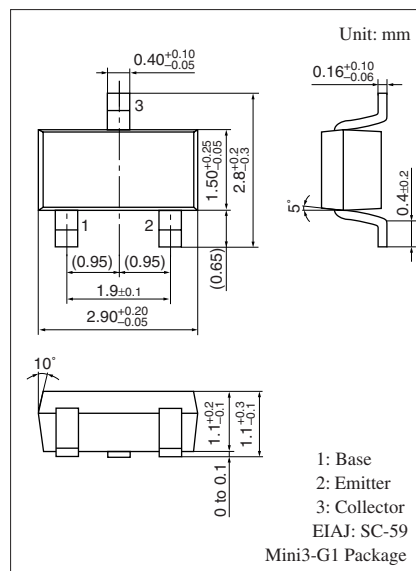
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts
- Mini type package allowing easy automatic insertion through tape packing and magazine packing

■ Resistance by Part Number

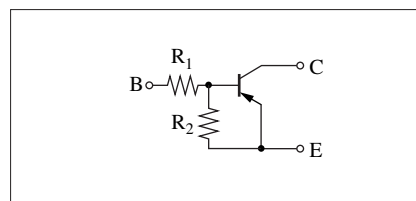
			Marking Symbol (R_1)	(R_2)
• UNR2110	(UN2110)	6L	47 k Ω	—
• UNR2111	(UN2111)	6A	10 k Ω	10 k Ω
• UNR2112	(UN2112)	6B	22 k Ω	22 k Ω
• UNR2113	(UN2113)	6C	47 k Ω	47 k Ω
• UNR2114	(UN2114)	6D	10 k Ω	47 k Ω
• UNR2115	(UN2115)	6E	10 k Ω	—
• UNR2116	(UN2116)	6F	4.7 k Ω	—
• UNR2117	(UN2117)	6H	22 k Ω	—
• UNR2118	(UN2118)	6I	0.51 k Ω	5.1 k Ω
• UNR2119	(UN2119)	6K	1 k Ω	10 k Ω
• UNR211D	(UN211D)	6M	47 k Ω	10 k Ω
• UNR211E	(UN211E)	6N	47 k Ω	22 k Ω
• UNR211F	(UN211F)	6O	4.7 k Ω	10 k Ω
• UNR211H	(UN211H)	6P	2.2 k Ω	10 k Ω
• UNR211L	(UN211L)	6Q	4.7 k Ω	4.7 k Ω
• UNR211M	(UN211M)	EI	2.2 k Ω	47 k Ω
• UNR211N	(UN211N)	EW	4.7 k Ω	47 k Ω
• UNR211T	(UN211T)	EY	22 k Ω	47 k Ω
• UNR211V	(UN211V)	FC	2.2 k Ω	2.2 k Ω
• UNR211Z	(UN211Z)	FE	4.7 k Ω	22 k Ω

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

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	200	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$



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 μA, I _E = 0	−50			V
Collector-emitter voltage (Base open)		V _{CEO}	I _C = −2 mA, I _B = 0	−50			V
Collector-base cutoff current (Emitter open)		I _{CBO}	V _{CB} = −50 V, I _E = 0			− 0.1	μA
Collector-emitter cutoff current (Base open)		I _{CEO}	V _{CE} = −50 V, I _B = 0			− 0.5	μA
Emitter-base cutoff current (Collector open)	UNR2110/2115/2116/2117	I _{EBO}	V _{EB} = −6 V, I _C = 0			− 0.01	mA
	UNR2113					− 0.1	
	UNR2112/2114/211D/ 211E/211M/211N/211T					− 0.2	
	UNR211Z					− 0.4	
	UNR2111					− 0.5	
	UNR211F/211H					−1.0	
	UNR2119					−1.5	
	UNR2118/211L/211V					−2.0	
Forward current transfer ratio	UNR211V	h _{FE}	V _{CE} = −10 V, I _C = −5 mA	6		20	—
	UNR2118/211L			20			
	UNR2119/211D/211F/211H			30			
	UNR2111			35			
	UNR2112/211E			60			
	UNR211Z			60		200	
	UNR2113/2114/211M			80			
	UNR211N/211T			80		400	
	UNR2110*/2115*/2116*/2117*			160		460	
Collector-emitter saturation voltage	V _{CE(sat)}	I _C = −10 mA, I _B = − 0.3 mA			− 0.25	V	
UNR211V		I _C = −10 mA, I _B = −1.5 mA					
Output voltage high-level		V _{OH}	V _{CC} = −5 V, V _B = − 0.5 V, R _L = 1 kΩ	−4.9			V
Output voltage low-level		V _{OL}	V _{CC} = −5 V, V _B = −2.5 V, R _L = 1 kΩ			− 0.2	V
			V _{CC} = −5 V, V _B = −3.5 V, R _L = 1 kΩ				
			V _{CC} = −5 V, V _B = −10 V, R _L = 1 kΩ				
			V _{CC} = −5 V, V _B = −6 V, R _L = 1 kΩ				
Transition frequency		f _T	V _{CB} = −10 V, I _E = 1 mA, f = 200 MHz		80		MHz
			V _{CB} = −10 V, I _E = 2 mA, f = 200 MHz		150		
Input resistance	UNR2118	R _I		−30%	0.51	+30%	kΩ
	UNR2119				1.0		
	UNR211H/211M/211V				2.2		
	UNR2116/211F/211L/211N/211Z				4.7		
	UNR2111/2114/2115				10		
	UNR2112/2117/211T				22		
	UNR2110/2113/211D/211E				47		

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

2. *: Rank classification

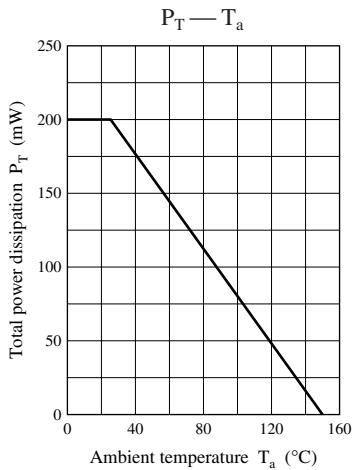
Rank	Q	R	S	No-rank
h_{FE}	160 to 260	210 to 340	290 to 460	160 to 460

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

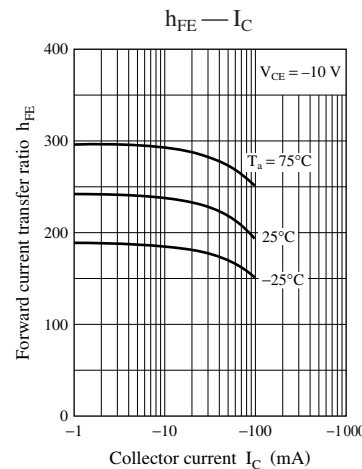
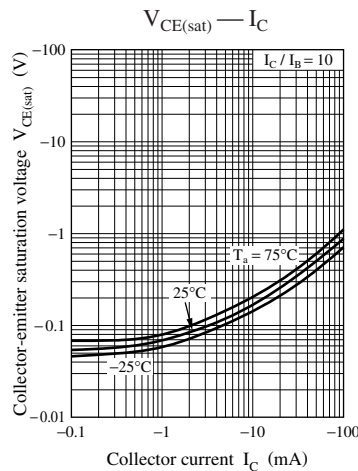
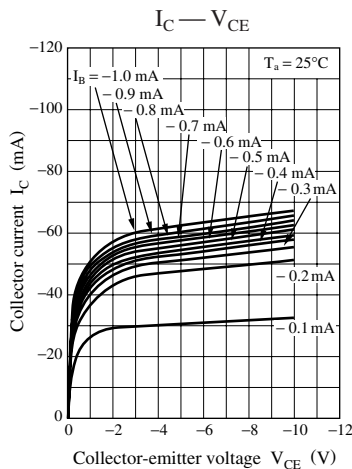
	Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Resistance ratio	UNR211M	R_1/R_2			0.047		—
	UNR211N				0.1		
	UNR2118/2119			0.08	0.10	0.12	
	UNR211Z				0.21		
	UNR2114			0.17	0.21	0.25	
	UNR211H			0.17	0.22	0.27	
	UNR211T				0.47		
	UNR211F			0.37	0.47	0.57	
	UNR211V				1.0		
	UNR2111/2112/2113/211L			0.8	1.0	1.2	
	UNR211E			1.70	2.14	2.60	
	UNR211D			3.7	4.7	5.7	

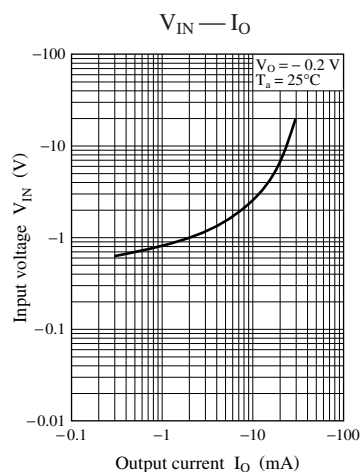
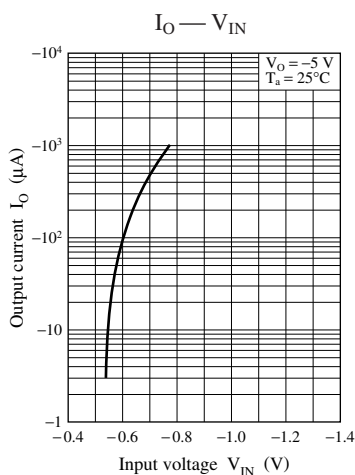
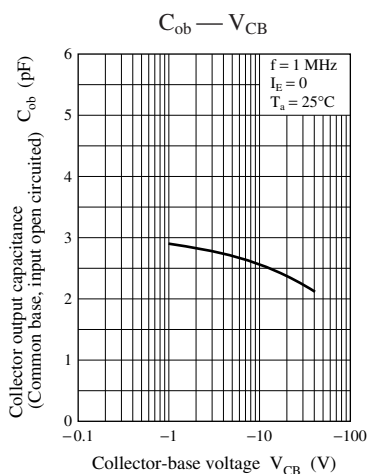
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

Common characteristics chart

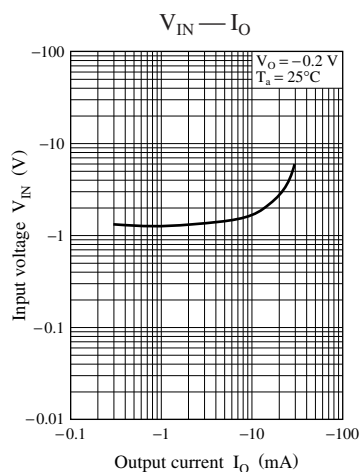
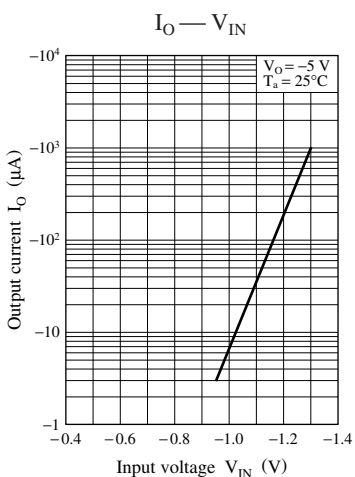
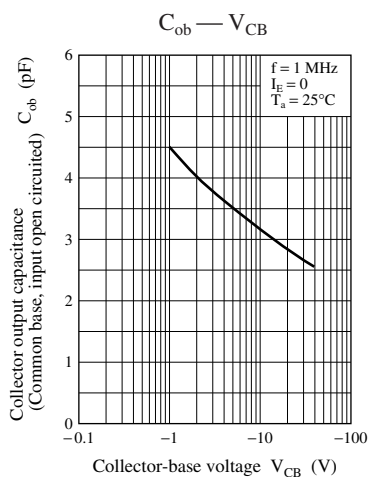
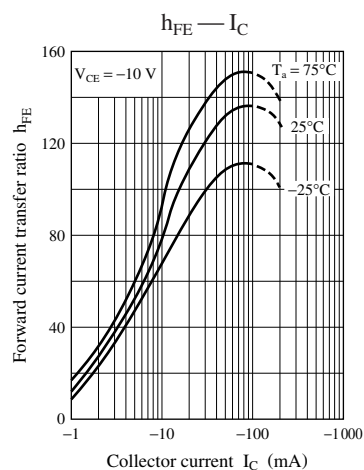
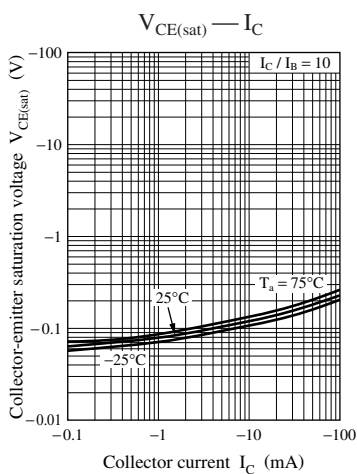
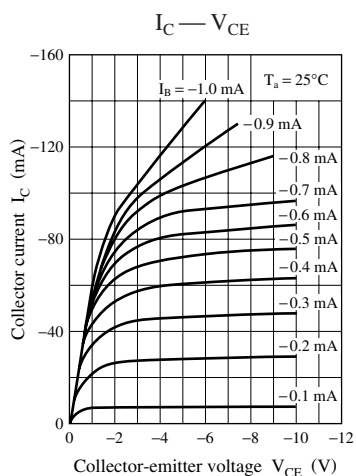


Characteristics charts of UNR2110

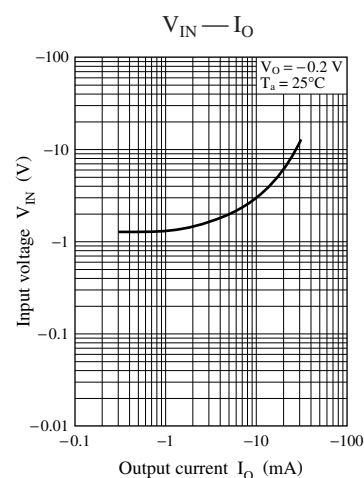
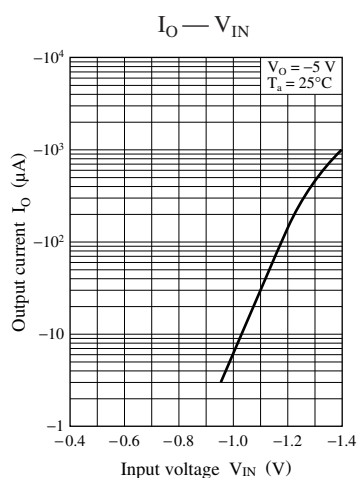
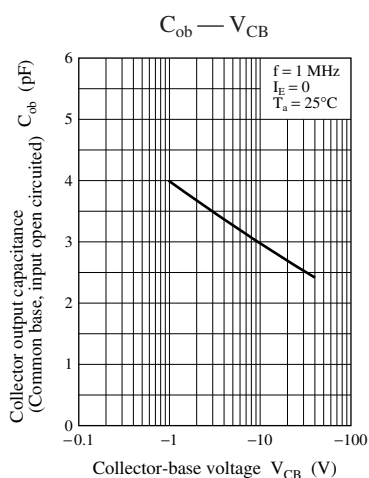
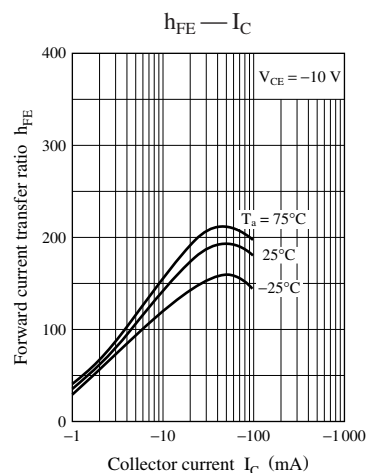
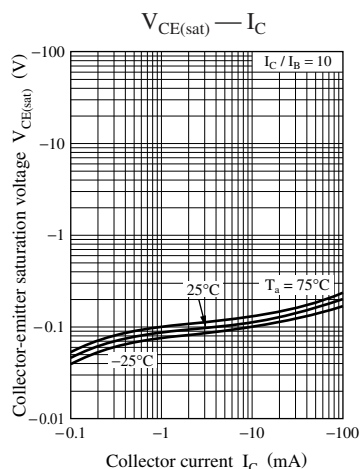
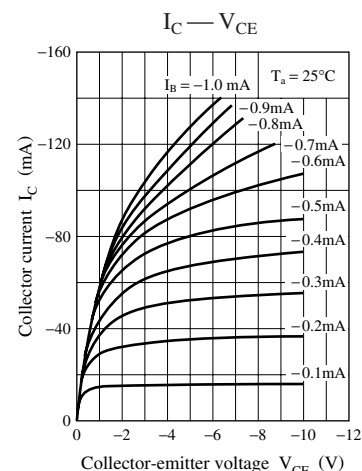




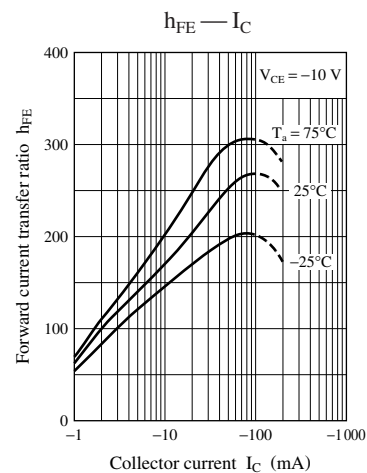
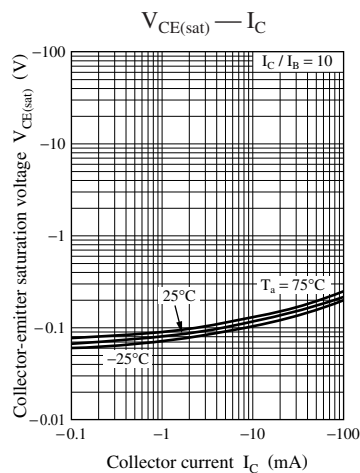
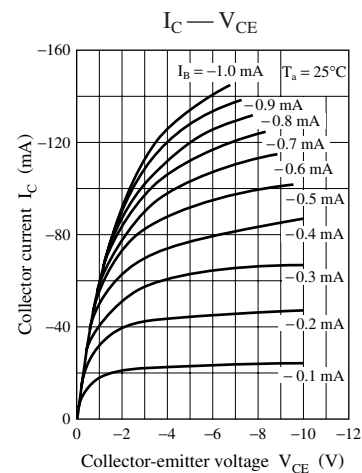
Characteristics charts of UNR2111

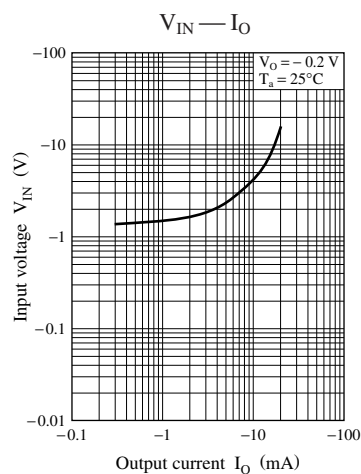
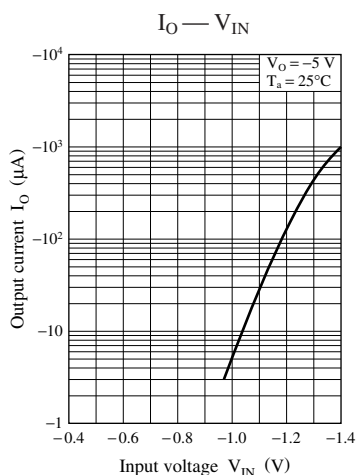
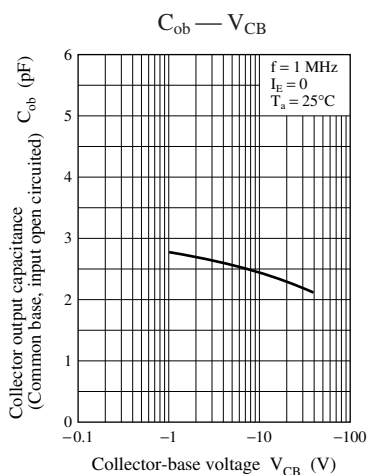


Characteristics charts of UNR2112

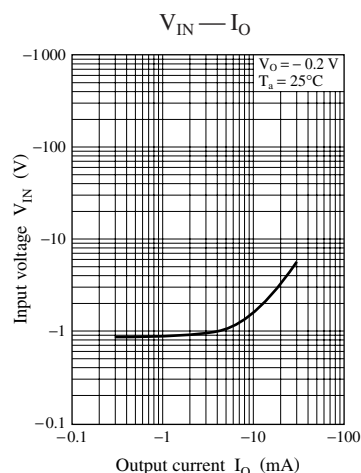
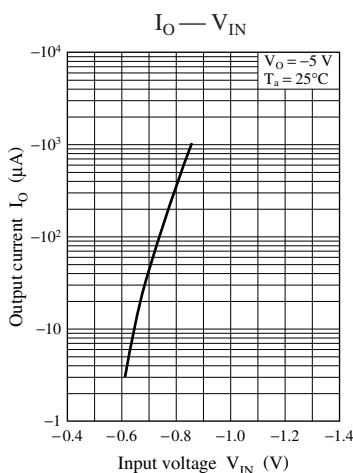
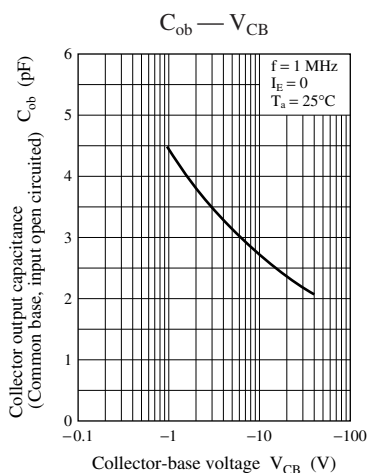
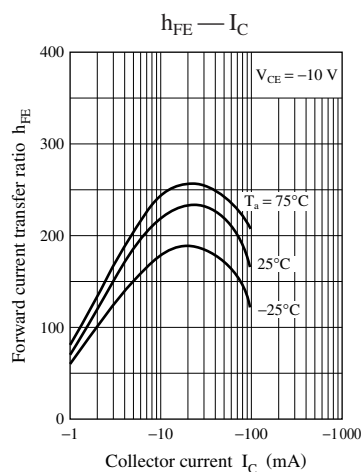
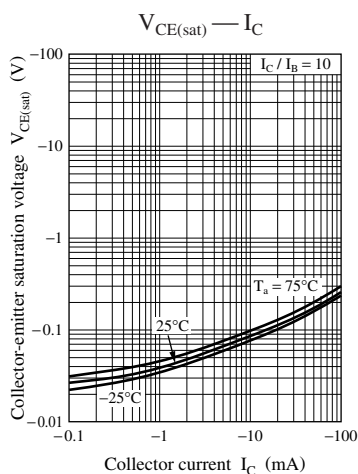
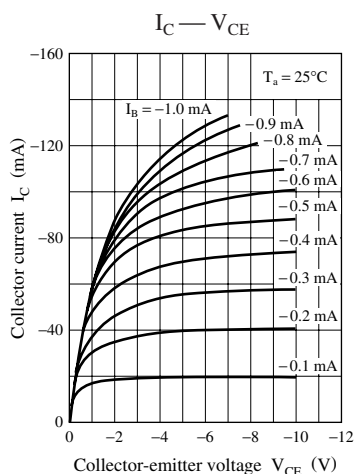


Characteristics charts of UNR2113

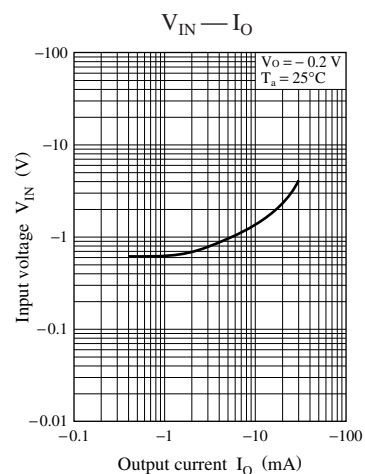
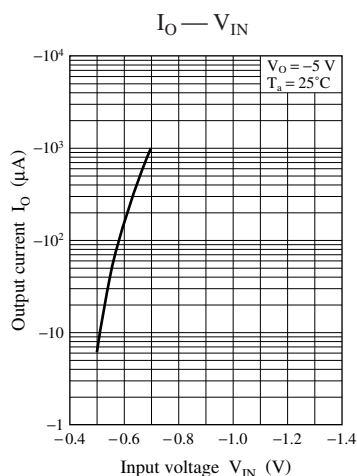
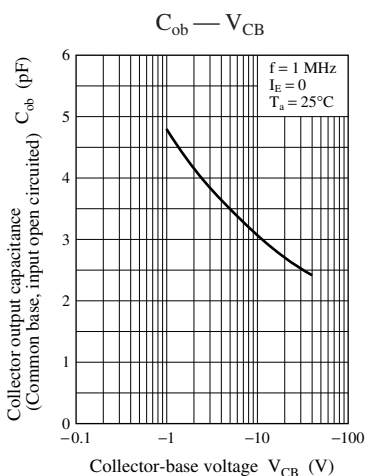
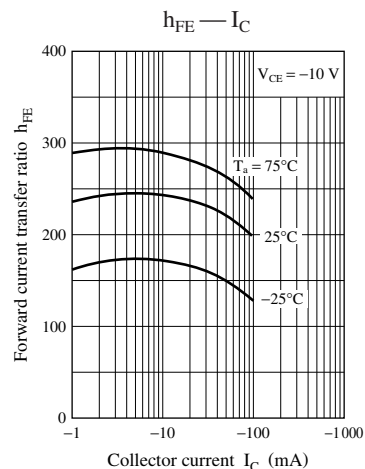
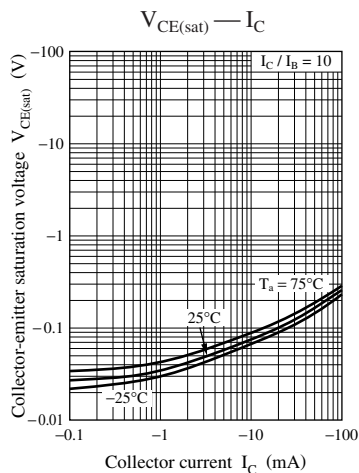
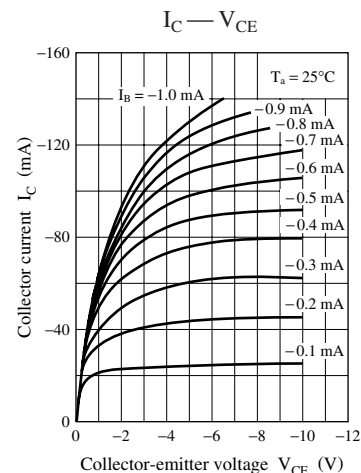




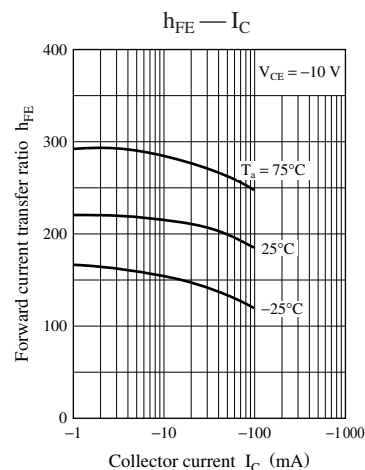
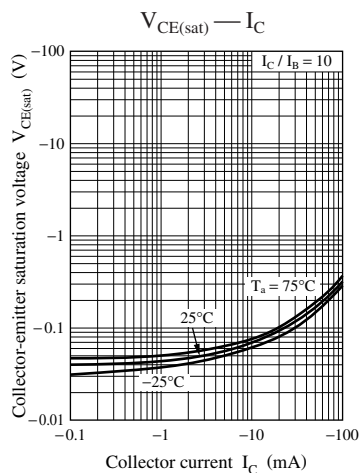
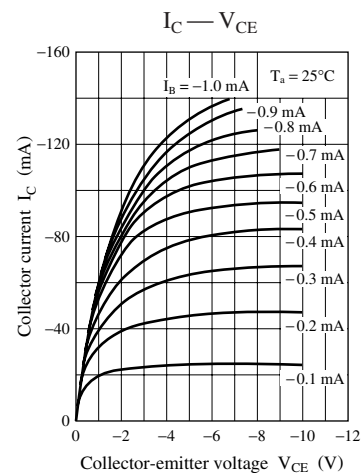
Characteristics charts of UNR2114

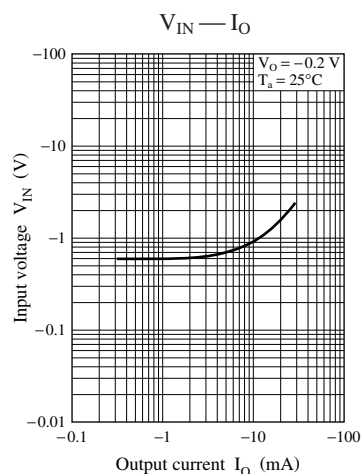
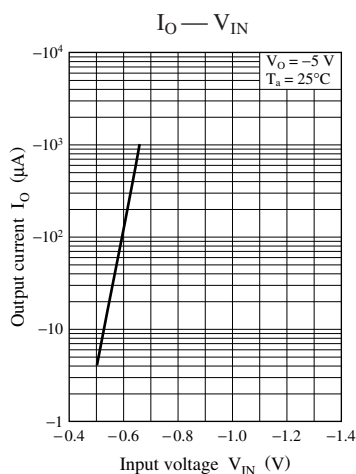
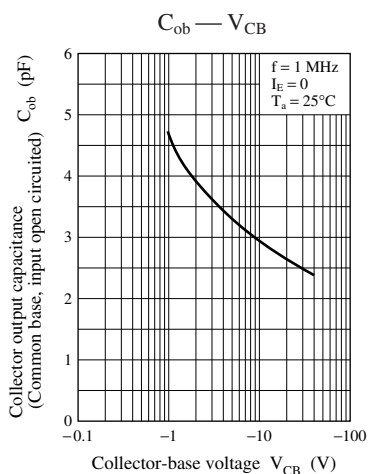


Characteristics charts of UNR2115

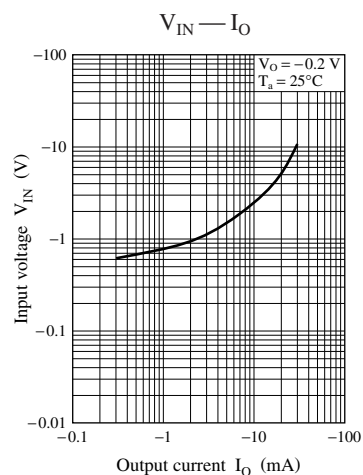
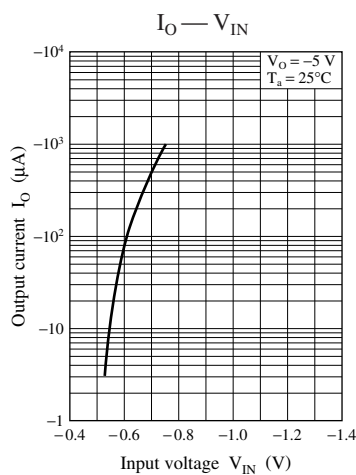
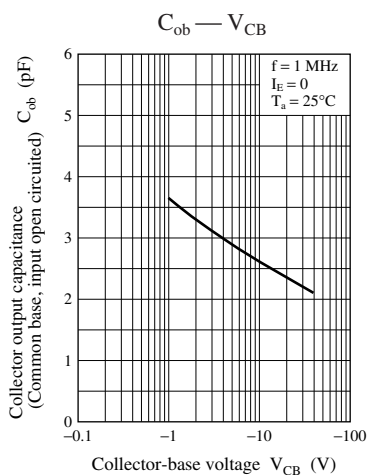
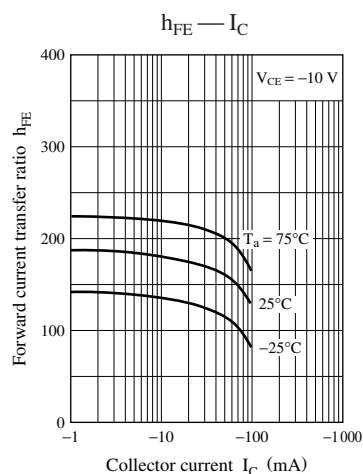
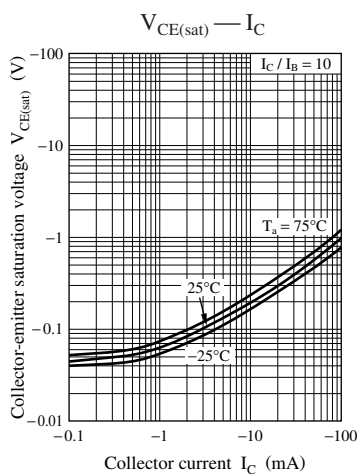
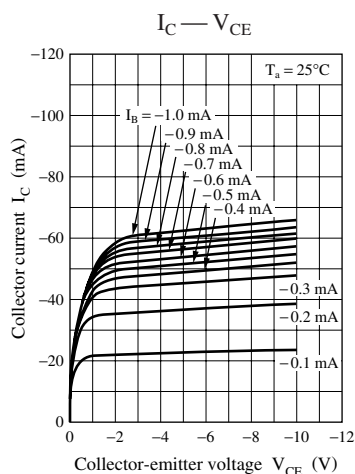


Characteristics charts of UNR2116

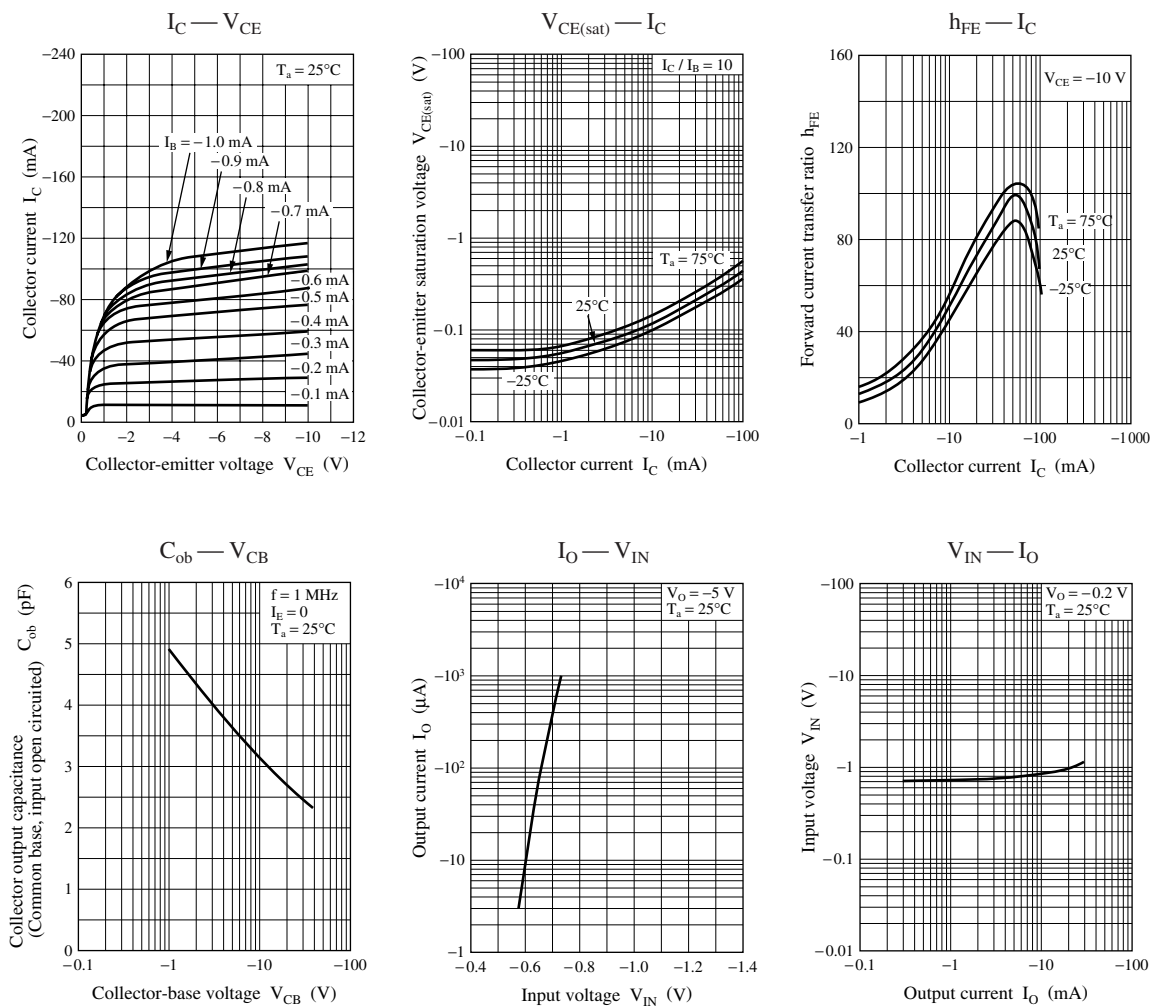




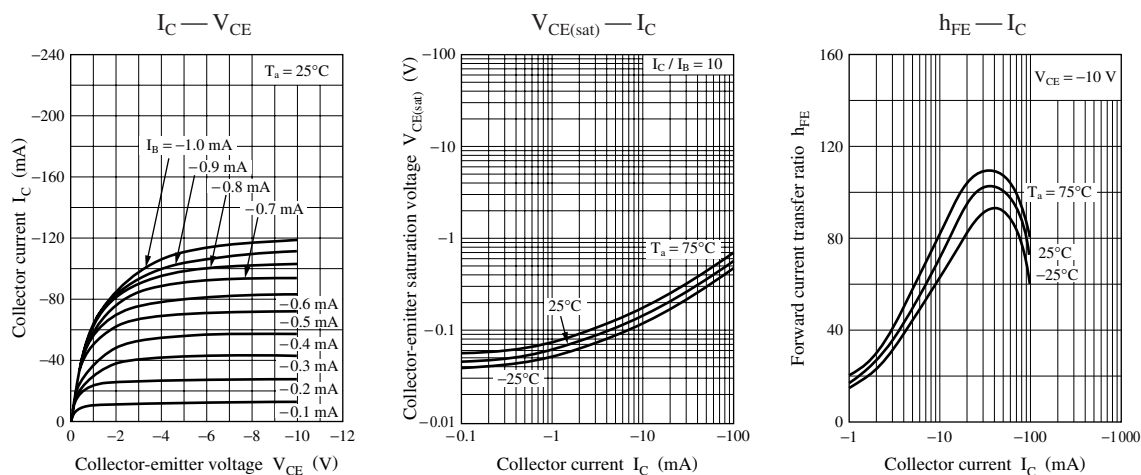
Characteristics charts of UNR2117

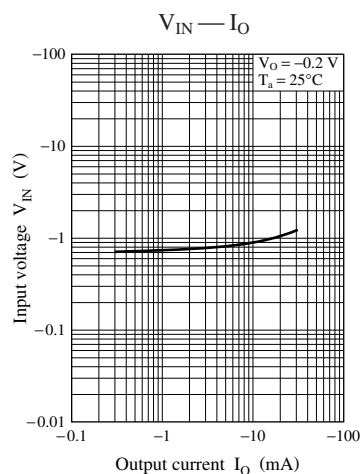
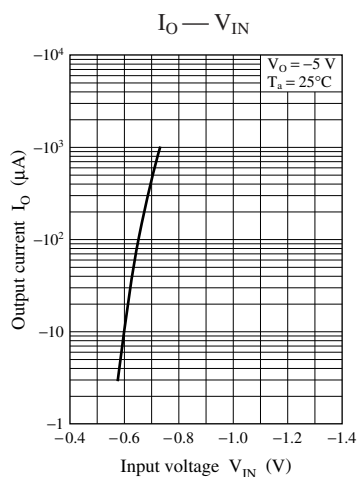
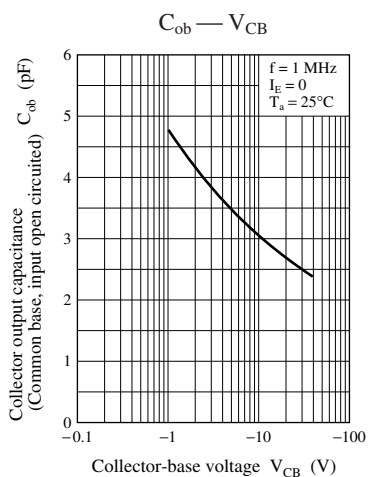


Characteristics charts of UNR2118

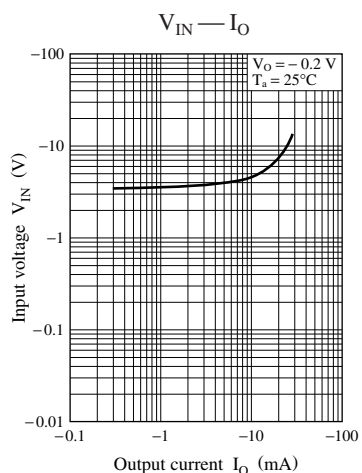
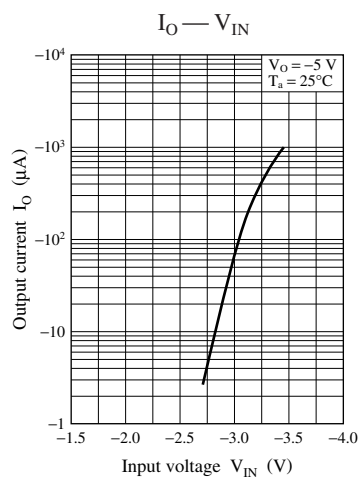
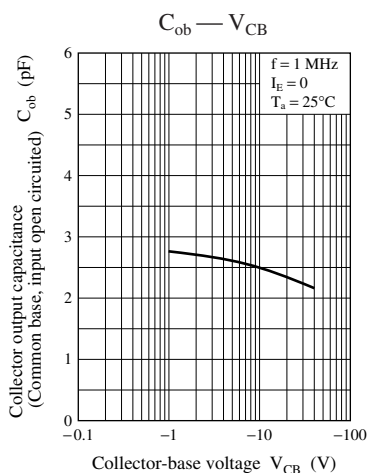
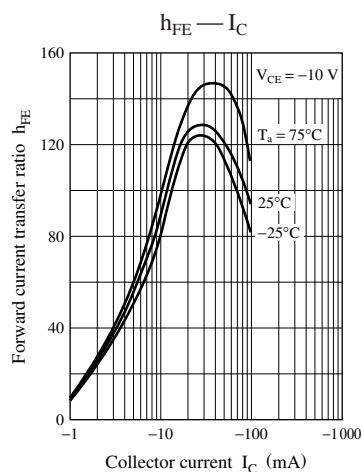
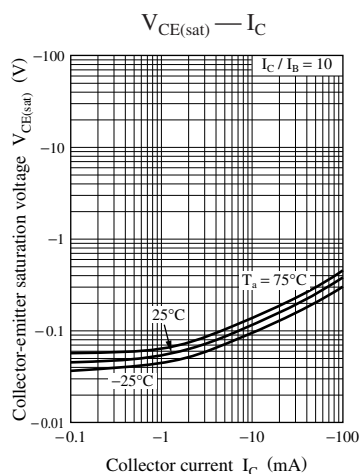
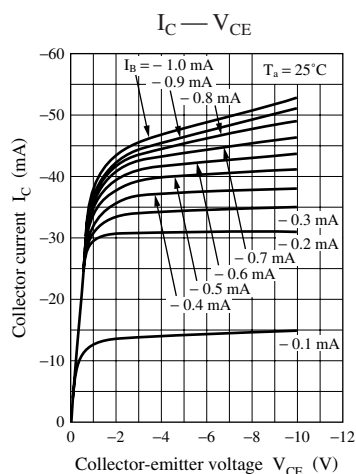


Characteristics charts of UNR2119

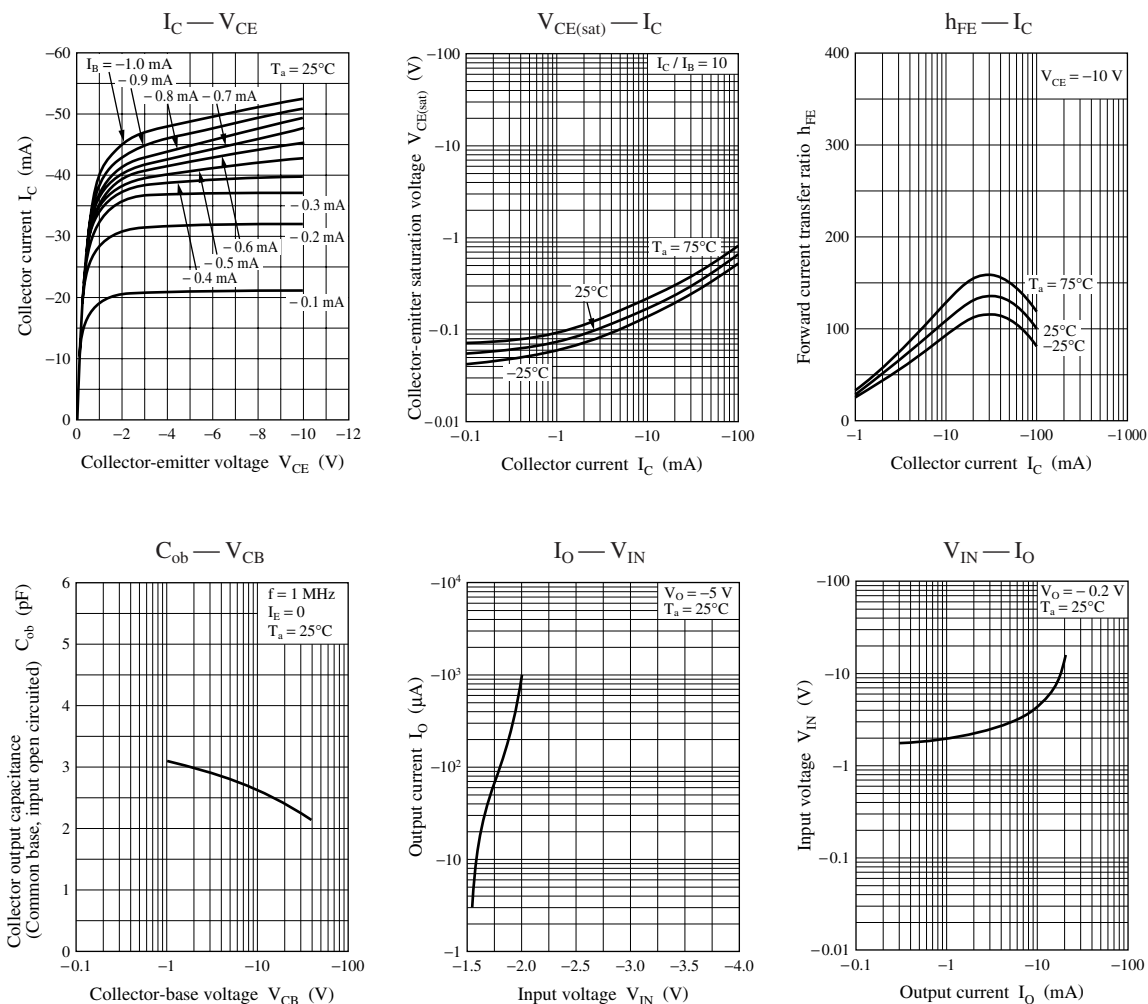




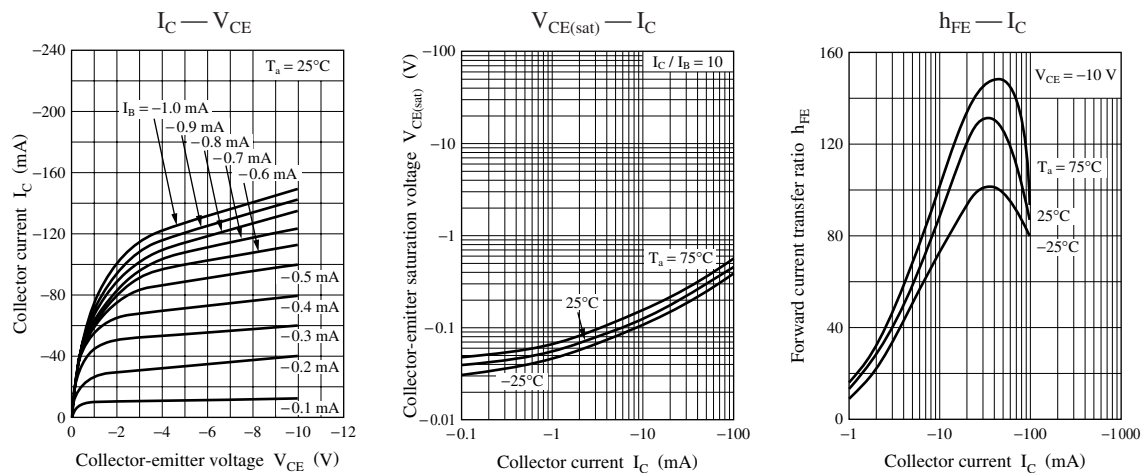
Characteristics charts of UNR211D

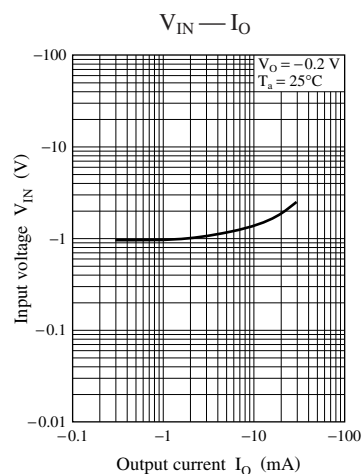
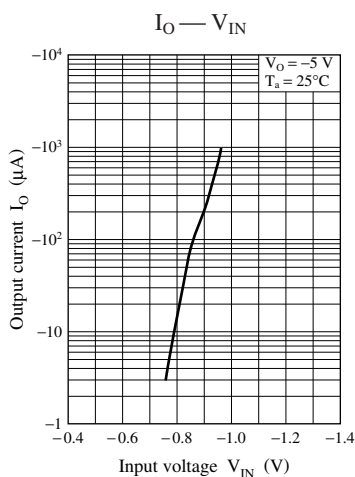
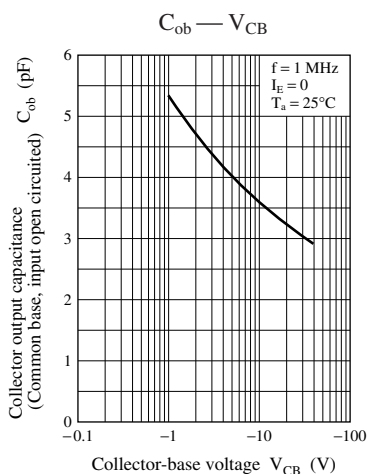


Characteristics charts of UNR211E

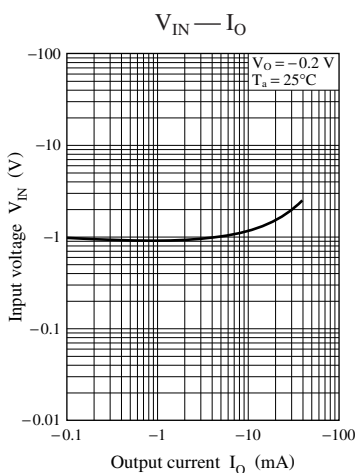
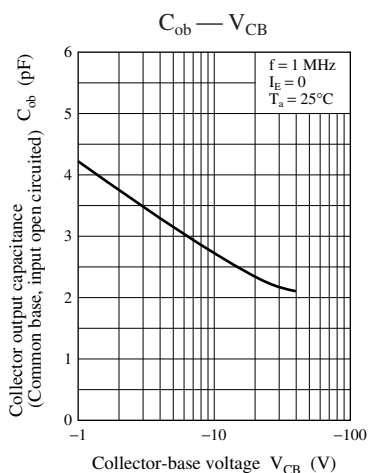
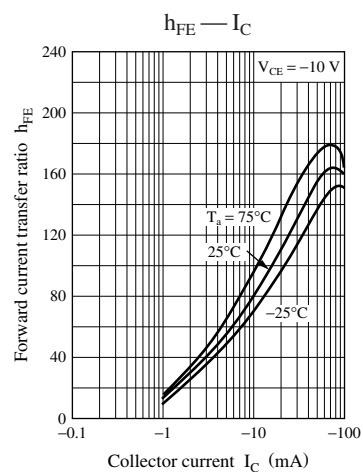
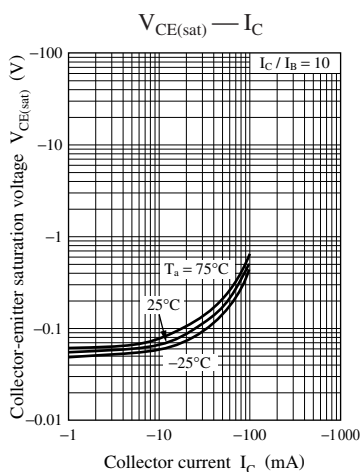
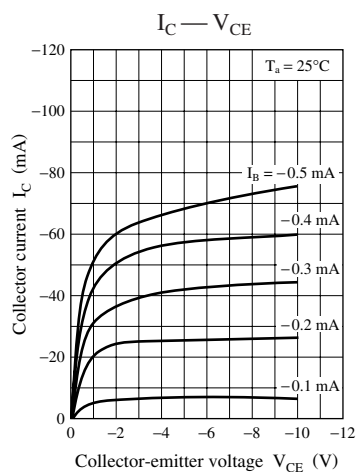


Characteristics charts of UNR211F

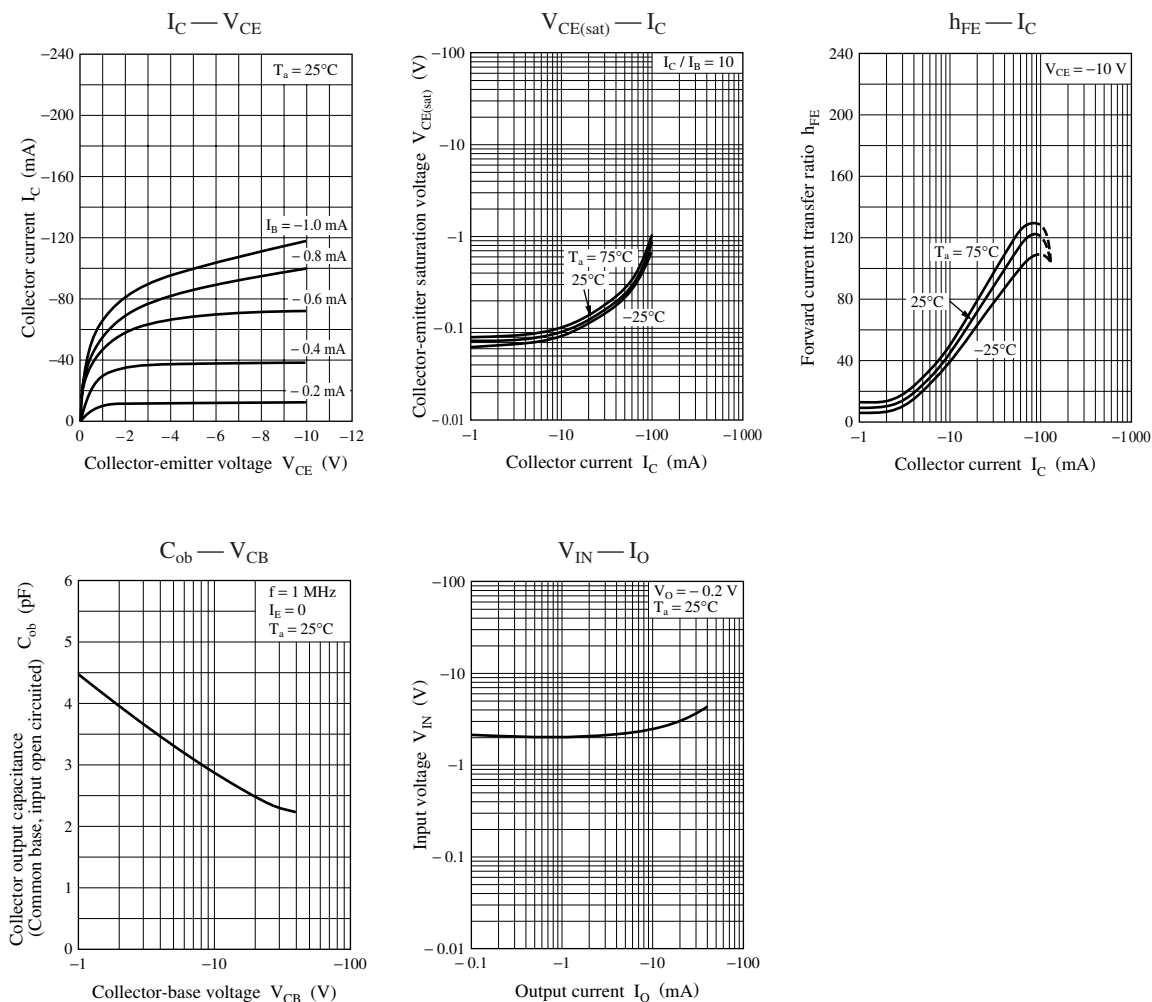




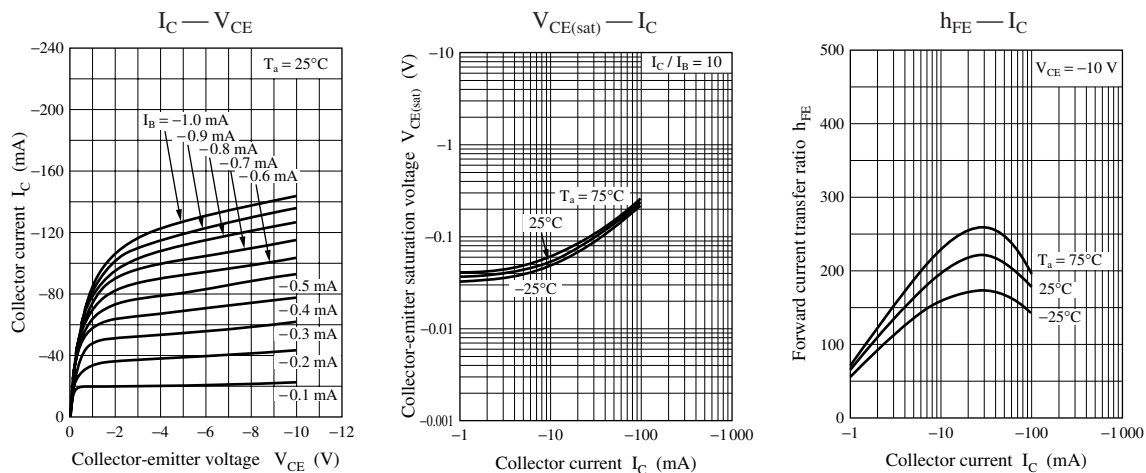
Characteristics charts of UNR211H

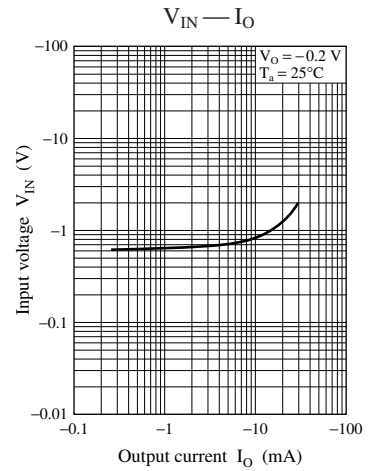
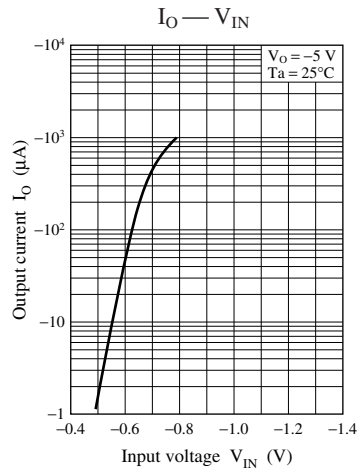
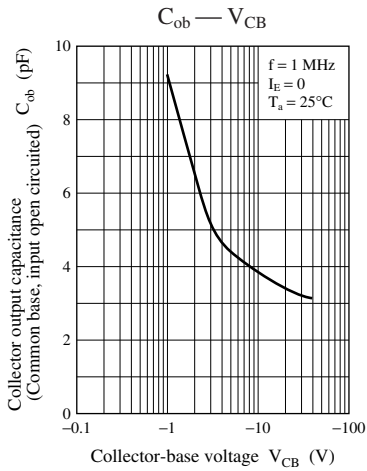


Characteristics charts of UNR211L

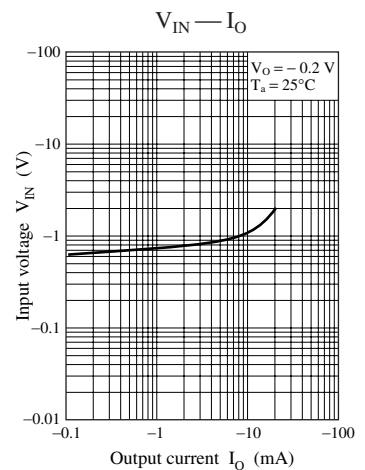
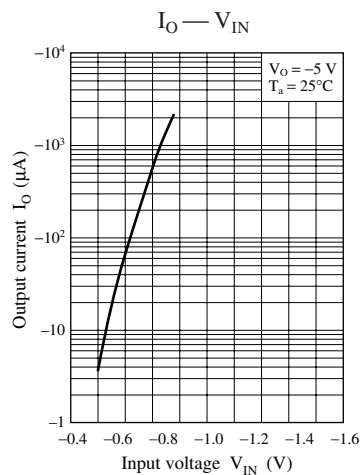
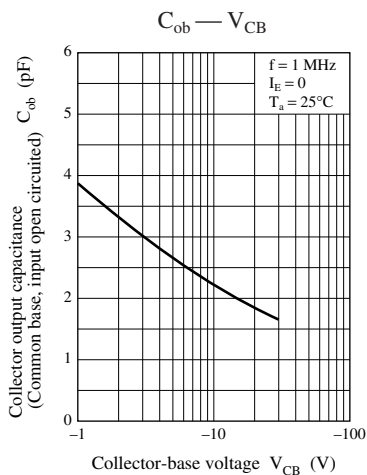
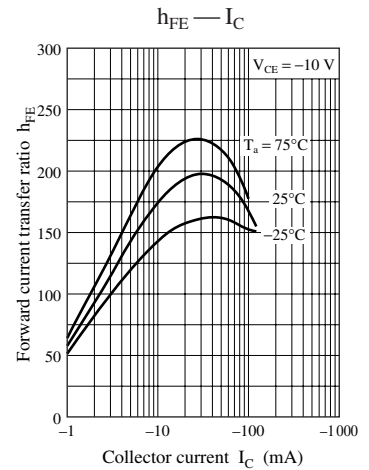
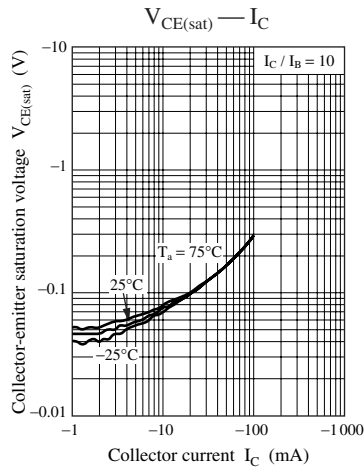
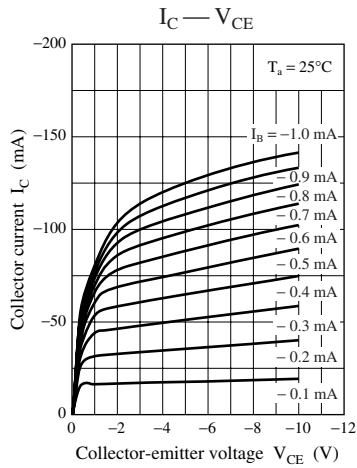


Characteristics charts of UNR211M

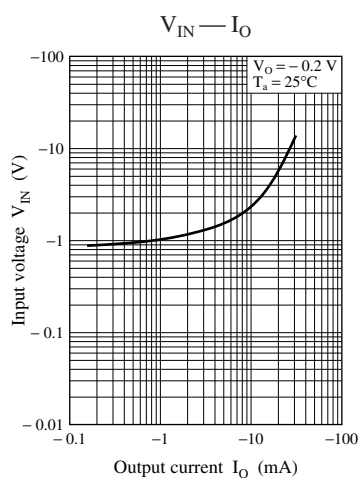
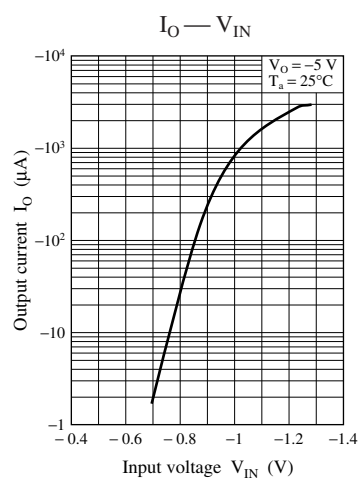
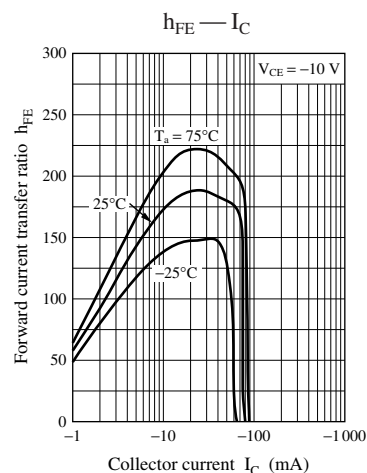
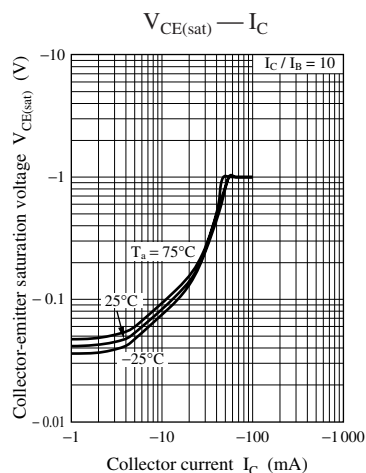
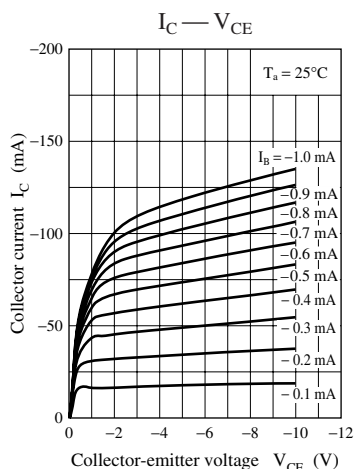




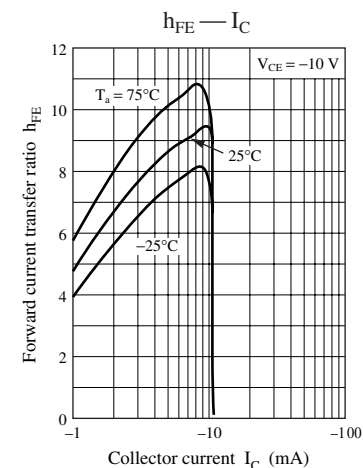
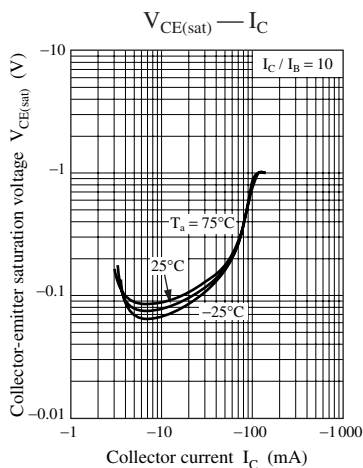
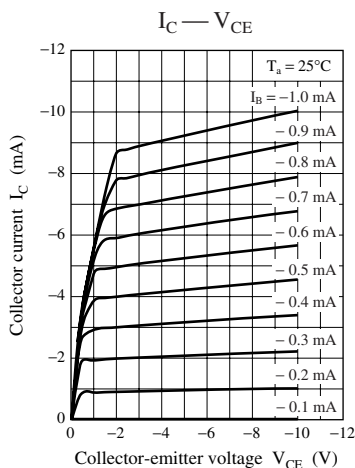
Characteristics charts of UNR211N

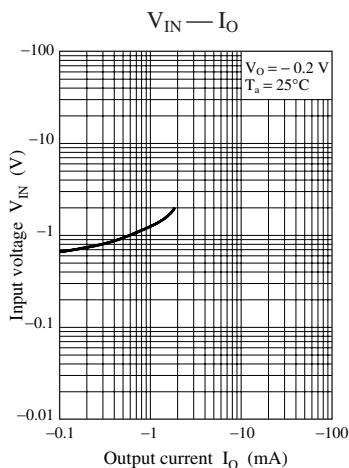
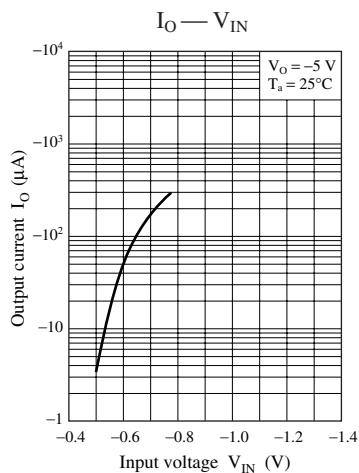


Characteristics charts of UNR211T

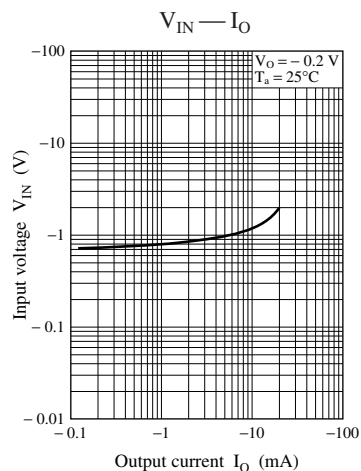
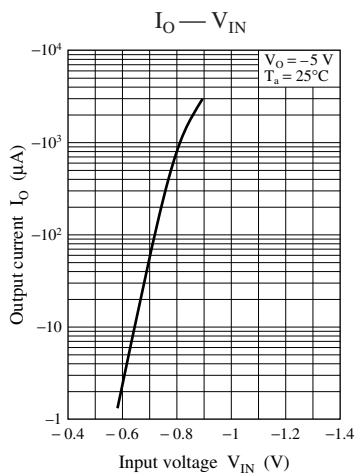
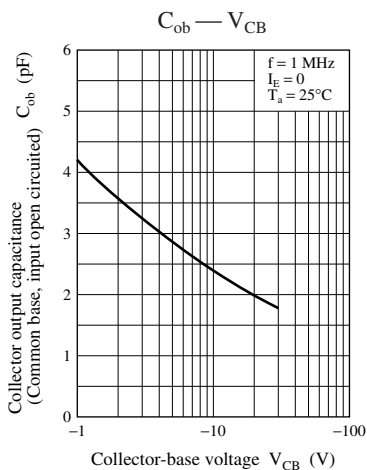
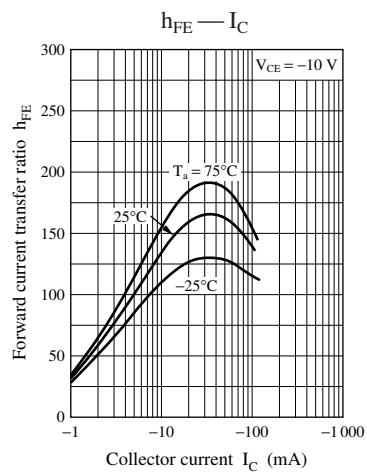
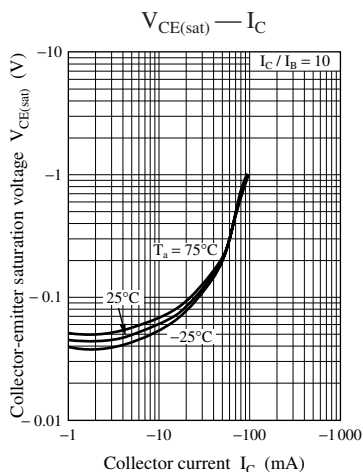
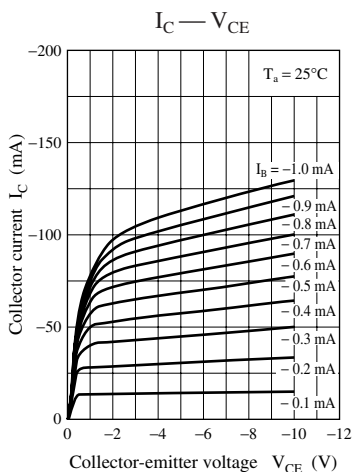


Characteristics charts of UNR211V





Characteristics charts of UNR211Z



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.