

UNR9111/9112/9113/9114/9115/9116/9117/9118/9119/9110/ 911D/911E/911F/911H/911L/911AJ/911BJ/911CJ

(UN9111/9112/9113/9114/9115/9116/9117/9118/9119/9110/911D/911E/
911F/911H/911L/911AJ/911BJ/911CJ)

Silicon PNP epitaxial planer transistor

For digital circuits

Features

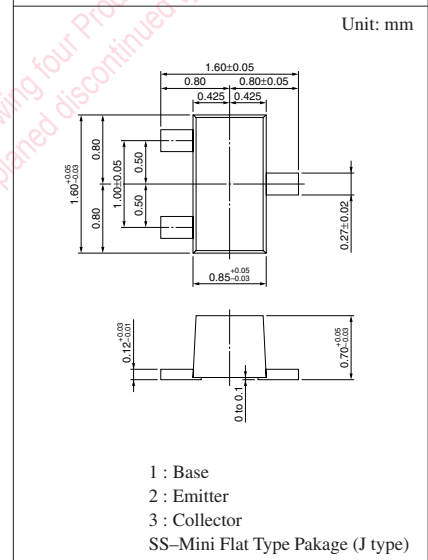
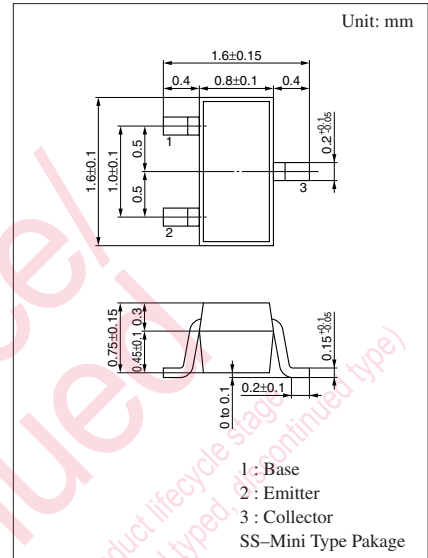
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts.
- SS-Mini type package, allowing automatic insertion through tape packing and magazine packing.

Resistance by Part Number

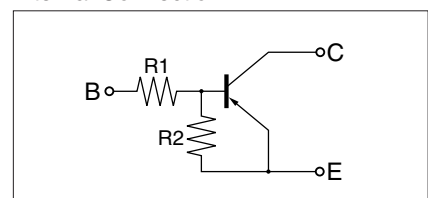
	Marking Symbol	(R ₁)	(R ₂)
● UNR9111	6A	10kΩ	10kΩ
● UNR9112	6B	22kΩ	22kΩ
● UNR9113	6C	47kΩ	47kΩ
● UNR9114	6D	10kΩ	47kΩ
● UNR9115	6E	10kΩ	—
● UNR9116	6F	4.7kΩ	—
● UNR9117	6H	22kΩ	—
● UNR9118	6I	0.51kΩ	5.1kΩ
● UNR9119	6K	1kΩ	10kΩ
● UNR9110	6L	47kΩ	—
● UNR911D	6M	47kΩ	10kΩ
● UNR911E	6N	47kΩ	22kΩ
● UNR911F	6O	4.7kΩ	10kΩ
● UNR911H	6P	2.2kΩ	10kΩ
● UNR911L	6Q	4.7kΩ	4.7kΩ
● UNR911AJ	6X	100kΩ	100kΩ
● UNR911BJ	6Y	100kΩ	—
● UNR911CJ	6Z	—	47kΩ

Absolute Maximum Ratings (T_a=25°C)

Parameter	Symbol	Ratings	Unit
Collector to base voltage	V _{CBO}	-50	V
Collector to emitter voltage	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 (Ta=25°C)

Parameter		Symbol	Conditions	min	typ	max	Unit	
Collector cutoff current		I _{CBO}	V _{CB} = -50V, I _E = 0			-0.1	μA	
		I _{CEO}	V _{CE} = -50V, I _B = 0			-0.5	μA	
Emitter cutoff current	UNR9111	I _{EBO}	V _{EB} = -6V, I _C = 0			-0.5	mA	
	UNR9112/9114/911E/911D					-0.2		
	UNR9113/UNR911AJ					-0.1		
	UNR9115/9116/9117/9110/UNR911BJ					-0.01		
	UNR911F/911H					-1.0		
	UNR9119					-1.5		
	UNR9118/911L/911CJ					-2.0		
Collector to base voltage		V _{CBO}	I _C = -10μA, I _E = 0	-50			V	
Collector to emitter voltage		V _{CEO}	I _C = -2mA, I _B = 0	-50			V	
Forward current transfer ratio	UNR9111	h _{FE}	V _{CE} = -10V, I _C = -5mA	35				
	UNR9112/911E			60				
	UNR9113/9114/UNR911AJ/911CJ			80				
	UNR9115/9116/9117/9110*UNR911BJ			160		460		
	UNR911F/911D/9119/911H			30				
	UNR9118/911L			20				
Collector to emitter saturation voltage		V _{CE(sat)}	I _C = -10mA, I _B = -0.3mA			-0.25	V	
Output voltage high level		V _{OH}	V _{CC} = -5V, V _B = -0.5V, R _L = 1kΩ	-4.9			V	
Output voltage low level		V _{OL}	V _{CC} = -5V, V _B = -2.5V, R _L = 1kΩ			-0.2	V	
			UNR9113/UNR911BJ	V _{CC} = -5V, V _B = -3.5V, R _L = 1kΩ				-0.2
			UNR911D	V _{CC} = -5V, V _B = -10V, R _L = 1kΩ				-0.2
			UNR911E	V _{CC} = -5V, V _B = -6V, R _L = 1kΩ				-0.2
			UNR911AJ	V _{CC} = -5V, V _B = -5.0V, R _L = 1kΩ				-0.2
Transition frequency		f _T	V _{CB} = -10V, I _E = 2mA, f = 200MHz		150		MHz	
UNR911AJ					80			
Input resistance	UNR9111/9114/9115	R _i		(-30%)	10	(+30%)	kΩ	
	UNR9112/9117				22			
	UNR9113/9110/911D/911E				47			
	UNR9116/911F/911L				4.7			
	UNR9118				0.51			
	UNR9119				1			
	UNR911H				2.2			
	UNR911AJ/911BJ				100			

* h_{FE} rank classification (UNR9115/9116/9117/9110)

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

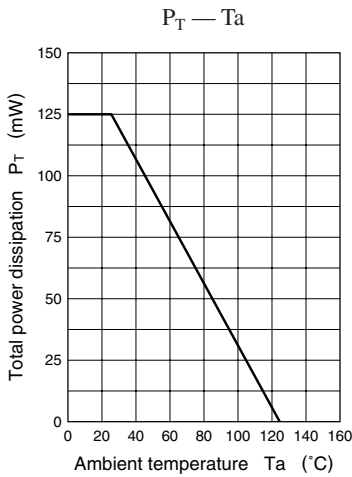
■ Electrical Characteristics (continued) (Ta=25°C)

Parameter		Symbol	Conditions	min	typ	max	Unit
Resistance ratio	UNR9111/9112/9113/911L	R ₁ /R ₂		0.8	1.0	1.2	
	UNR9114			0.17	0.21	0.25	
	UNR9118/9119			0.08	0.1	0.12	
	UNR911D				4.7		
	UNR911E				2.14		
	UNR911F				0.47		
	UNR911H			0.17	0.22	0.27	
	UNR911AJ				1.0		
Resistance between Emitter to Base	UNR911CJ	R ₂		-30%	47	30%	

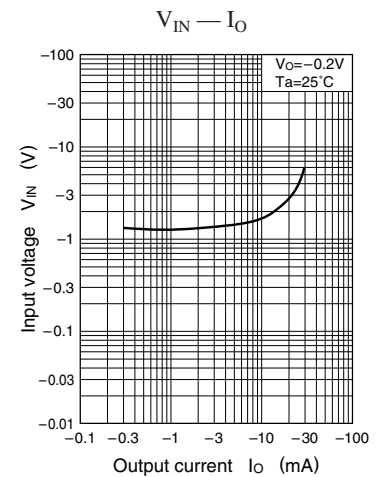
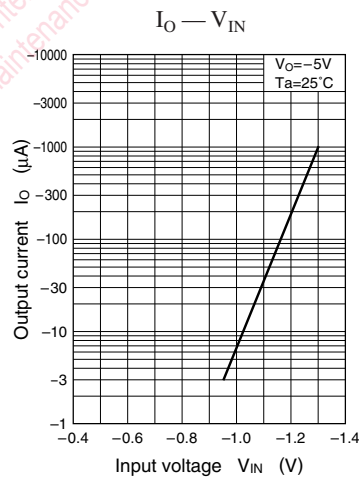
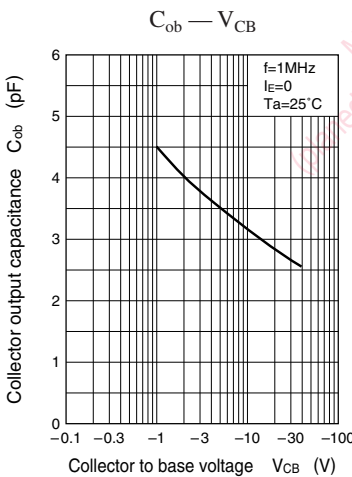
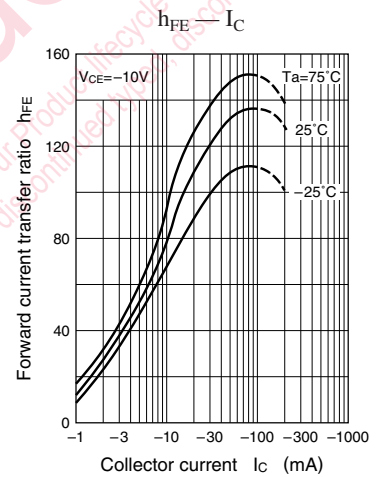
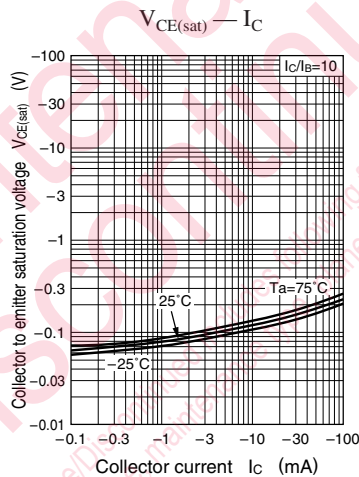
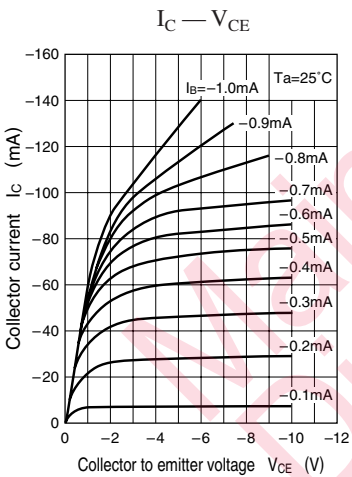
Maintenance/Discontinued

Maintenance/Discontinued includes following four Product lifecycle stage.
(planned maintenance type, maintenance type, planned discontinued type, discontinued type)

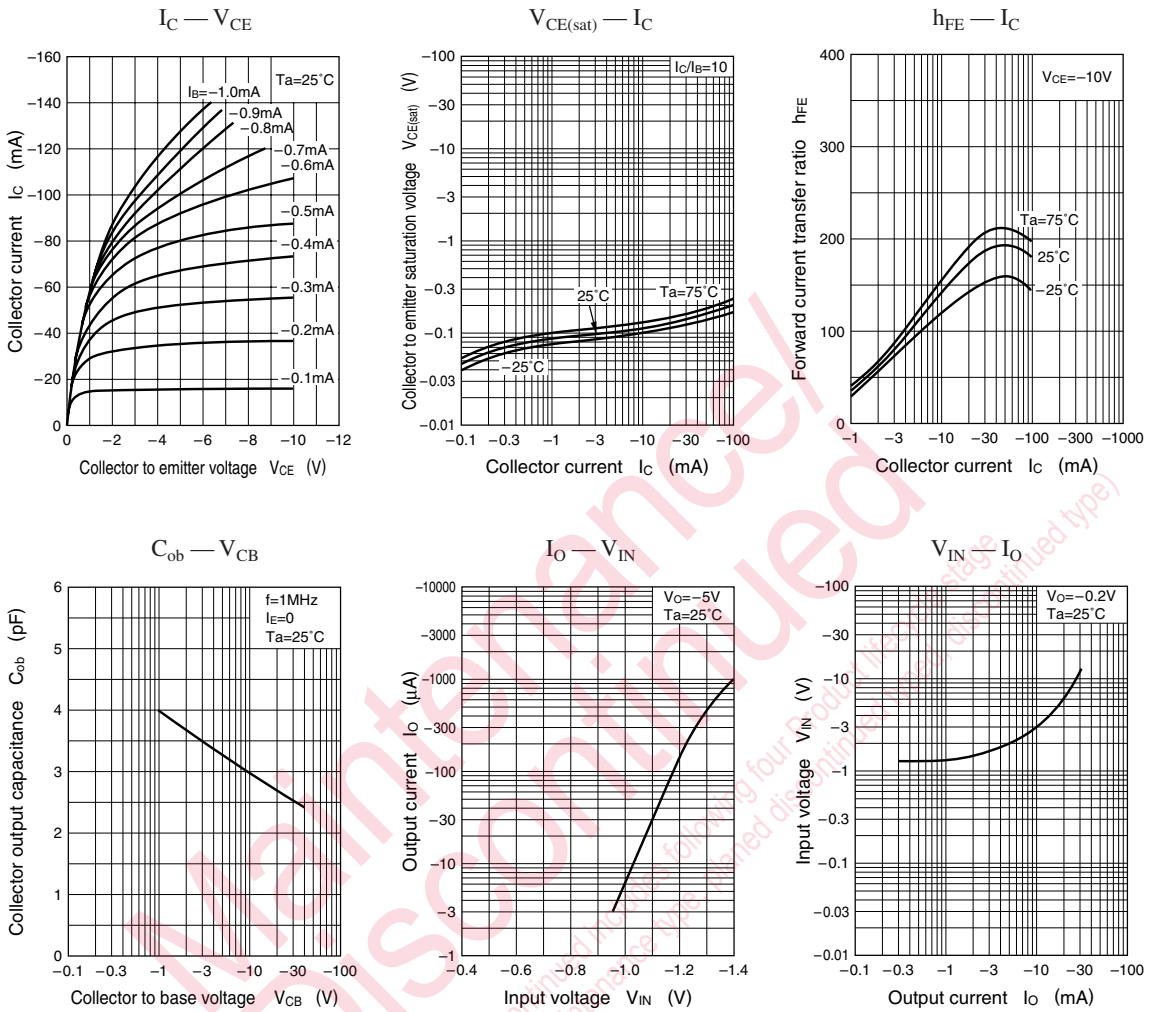
Common characteristics chart



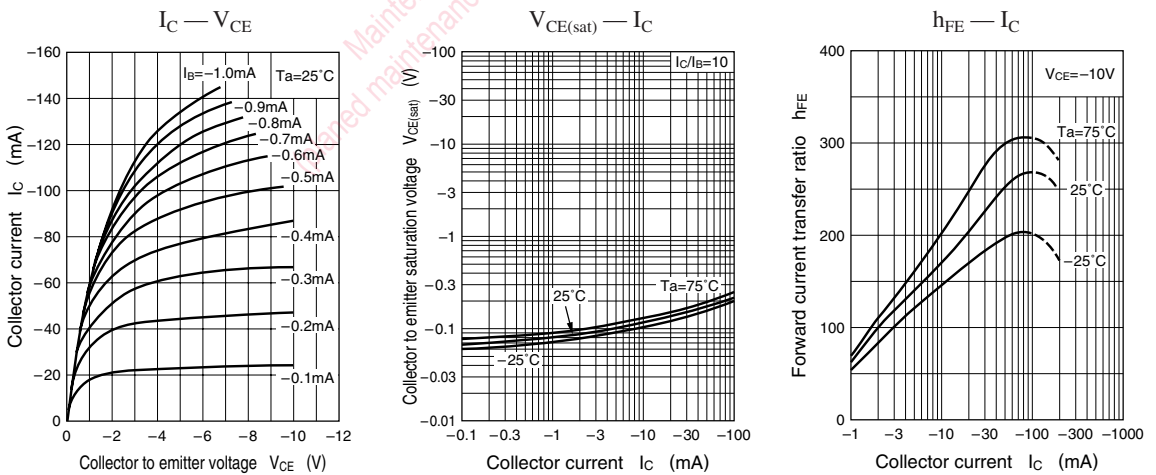
Characteristics charts of UNR9111

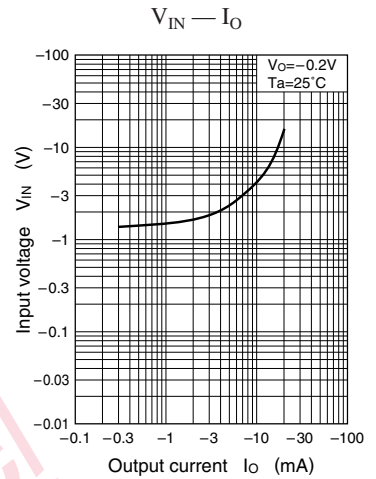
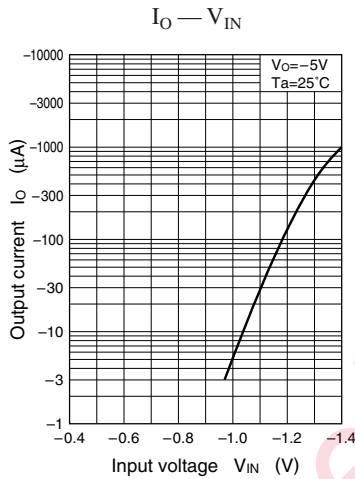
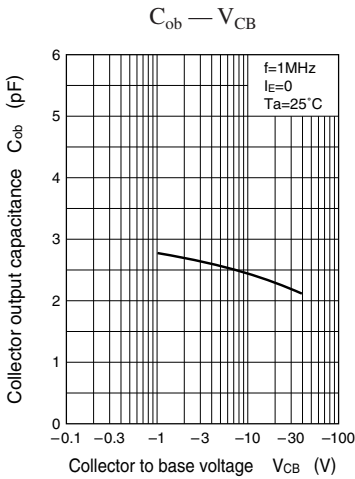


Characteristics charts of UNR9112

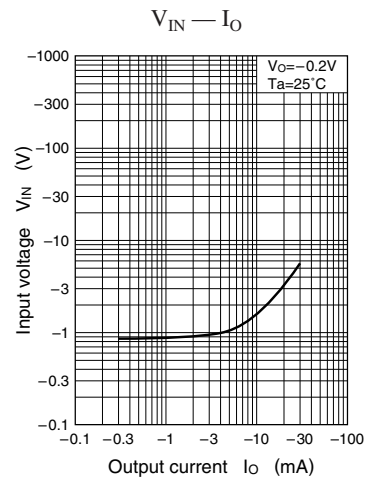
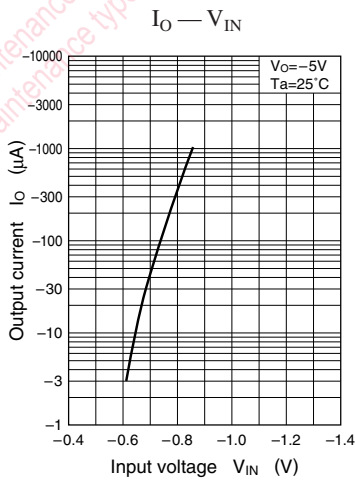
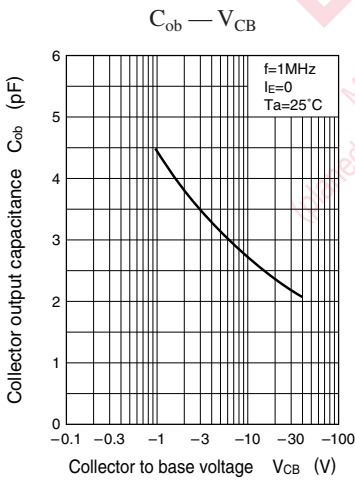
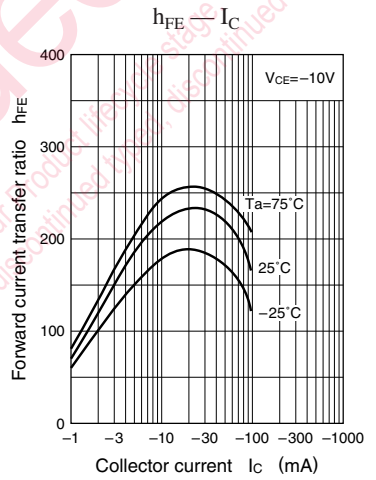
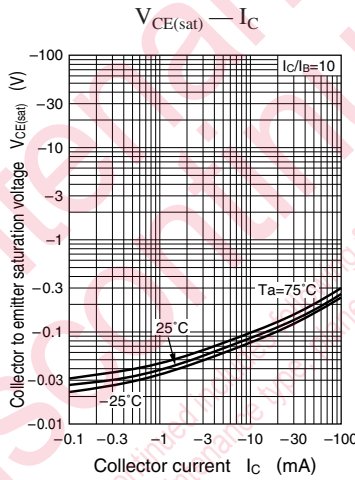
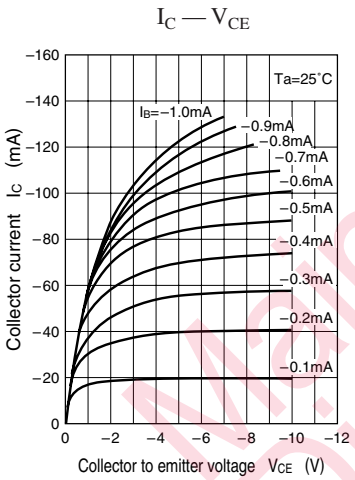


Characteristics charts of UNR9113

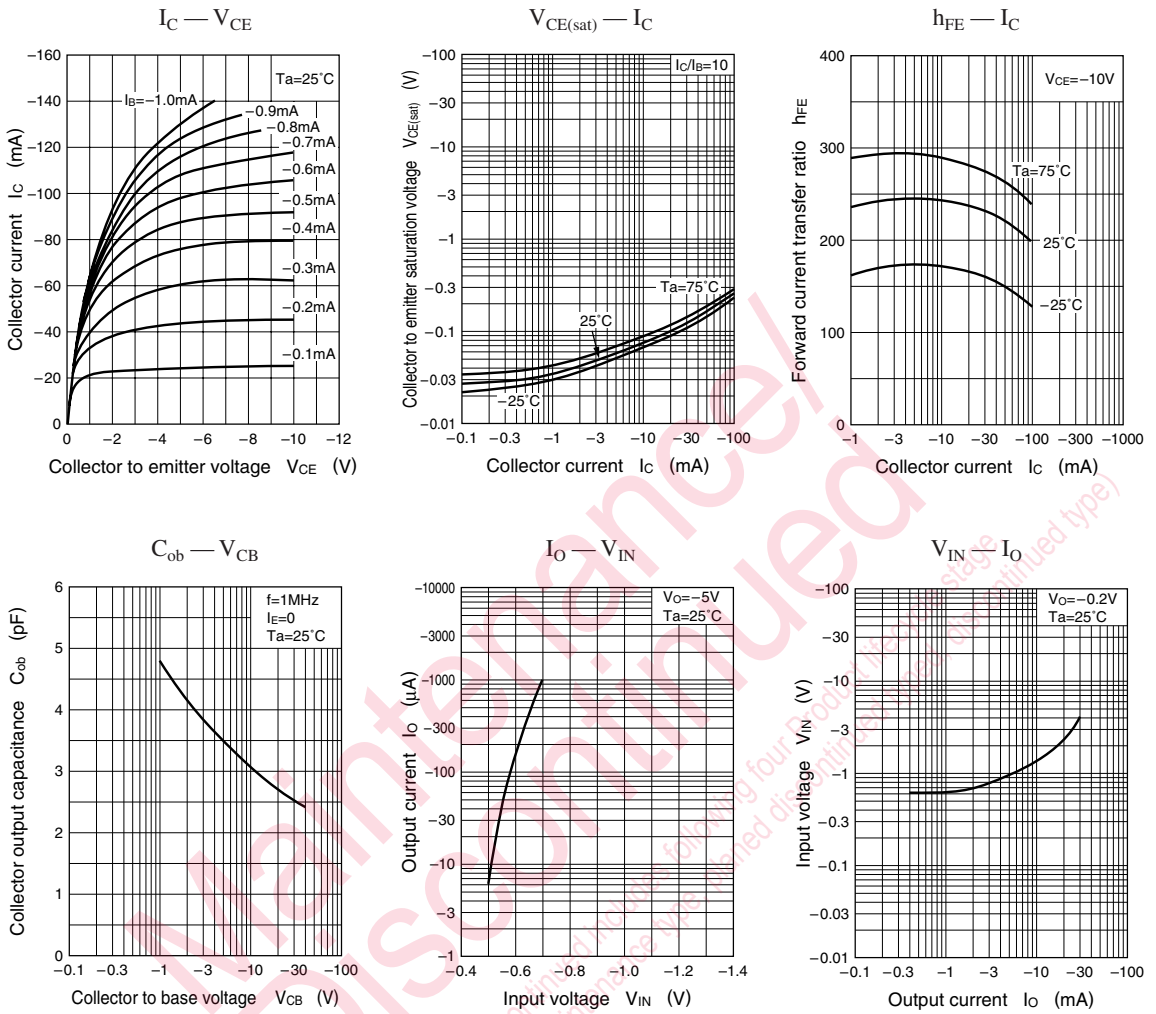




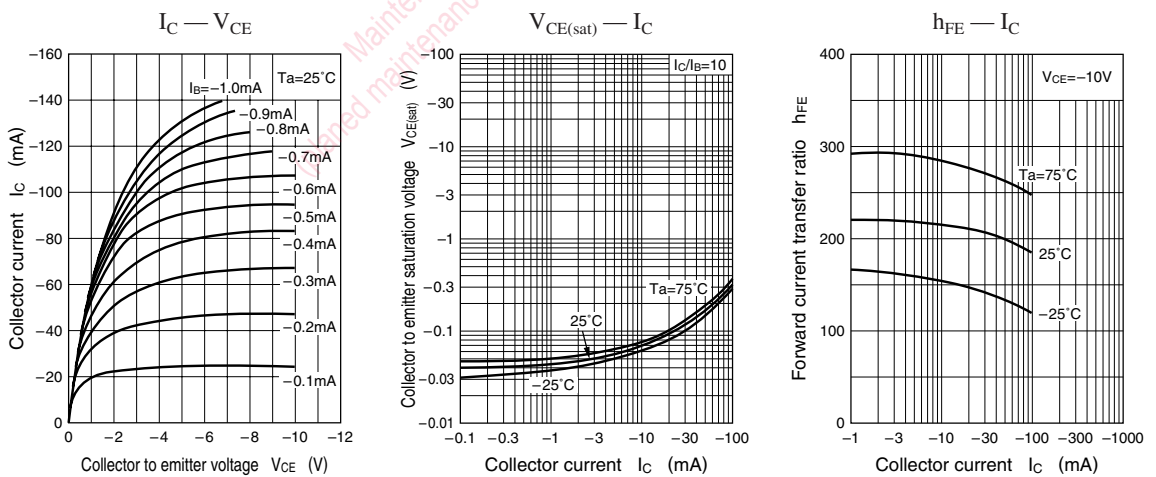
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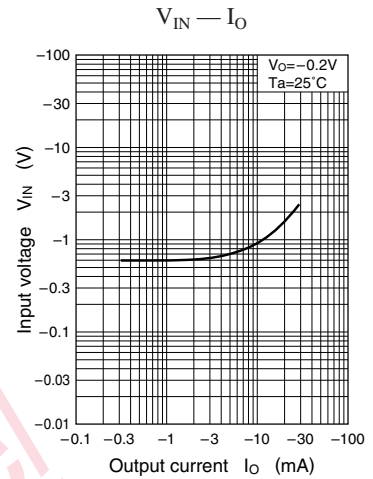
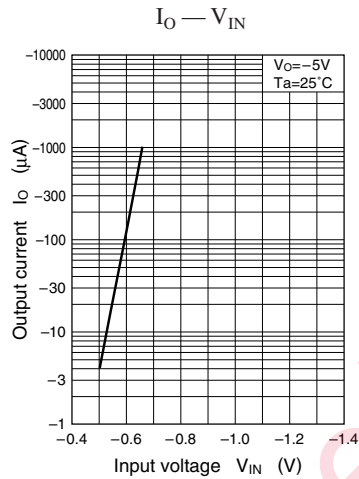
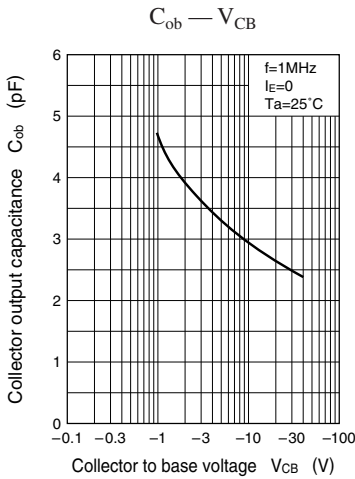


Characteristics charts of UNR9115

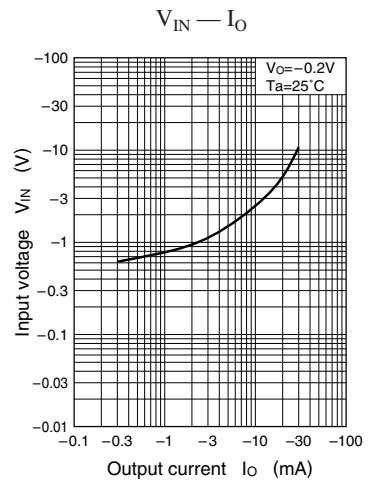
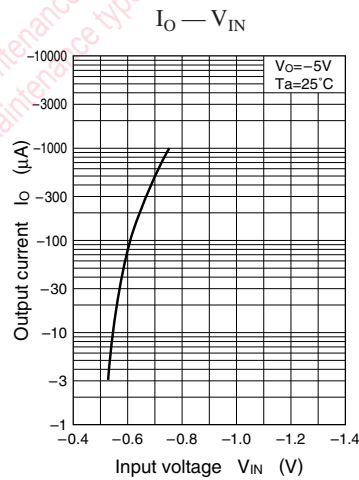
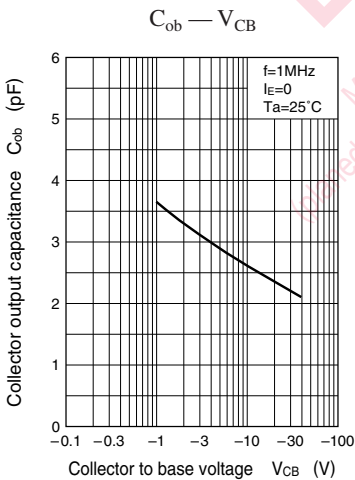
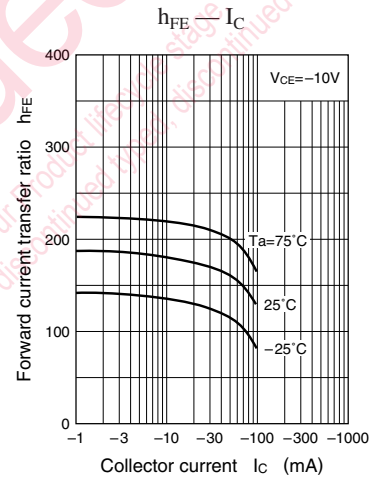
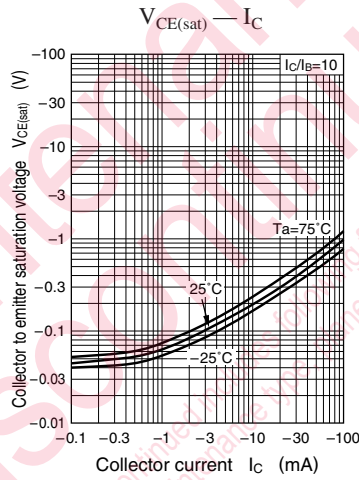
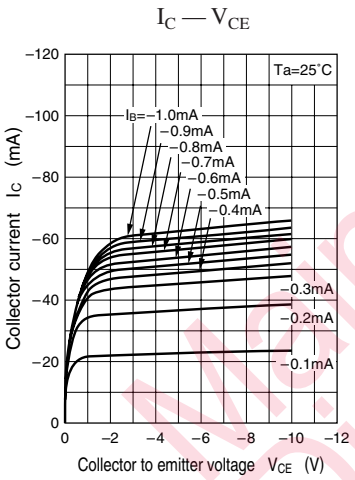


Characteristics charts of UNR9116

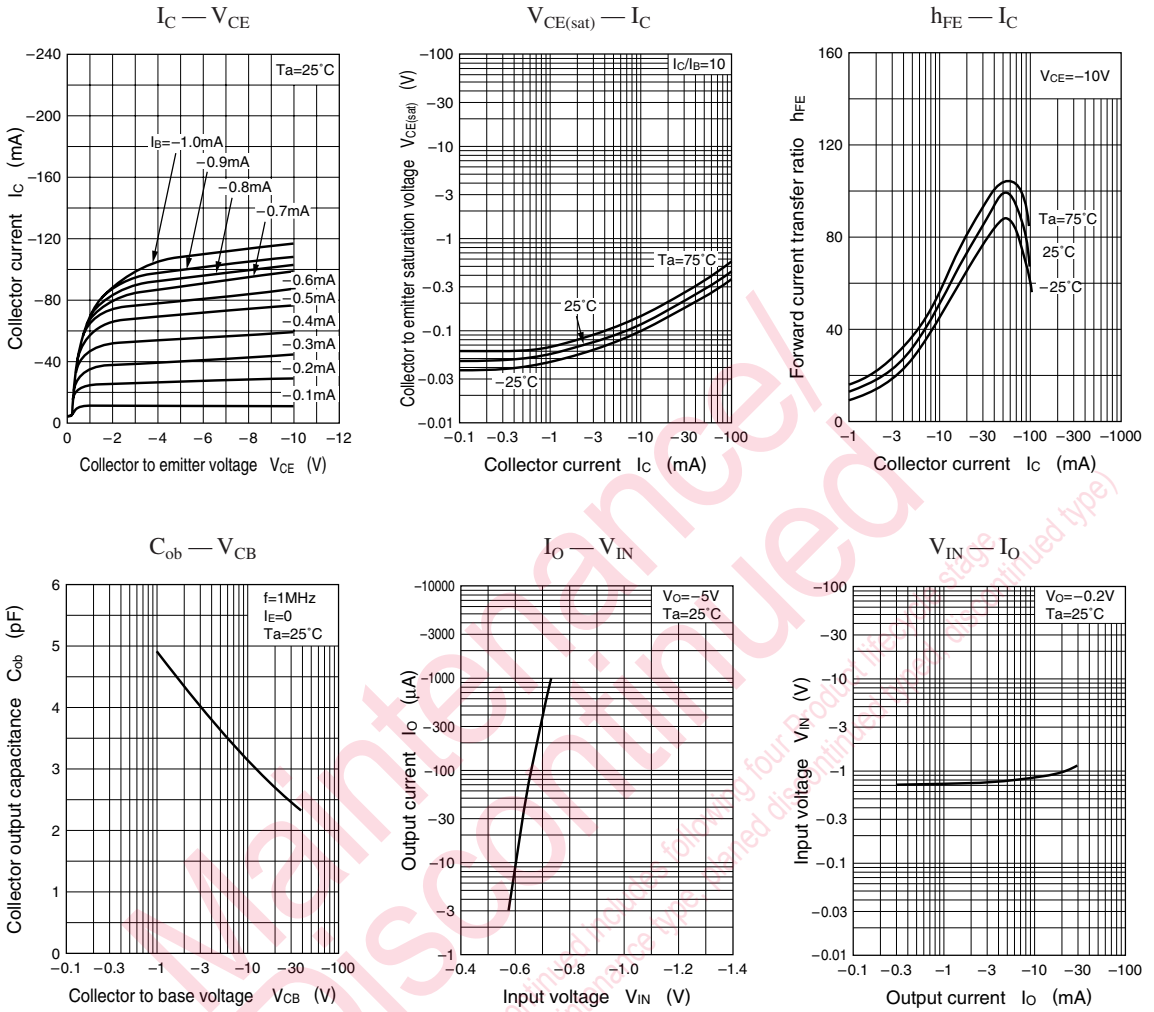




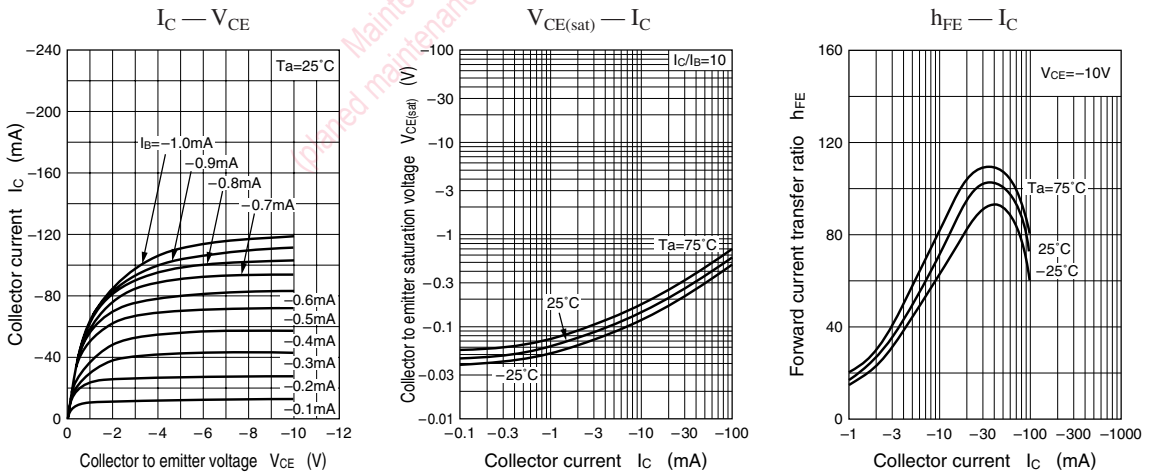
Characteristics charts of UNR9117

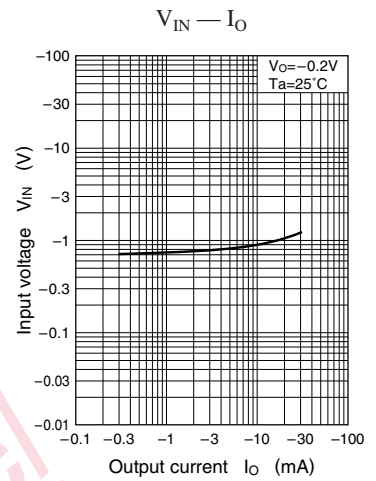
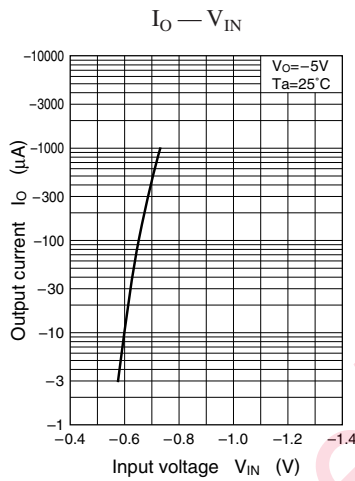
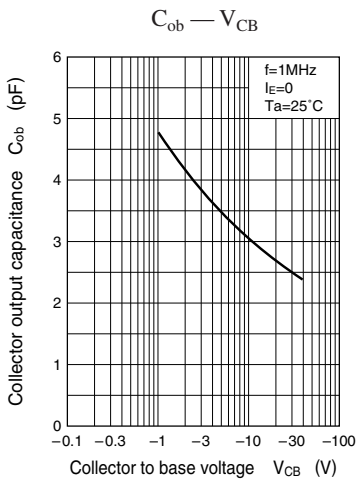


Characteristics charts of UNR9118

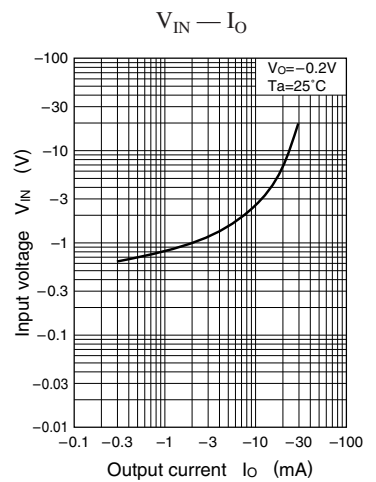
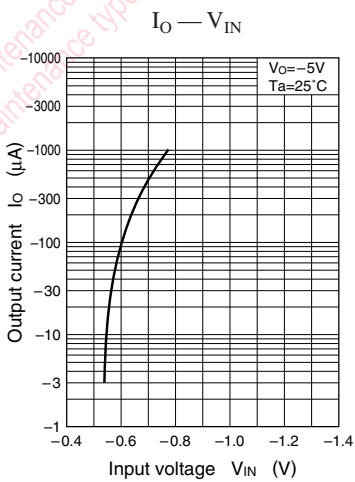
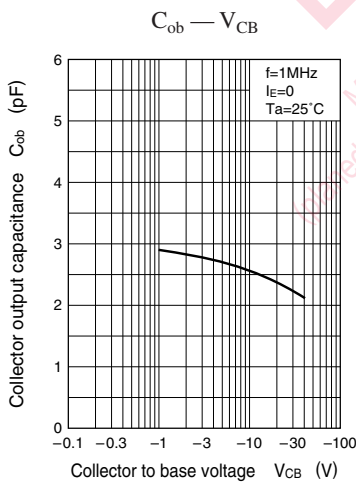
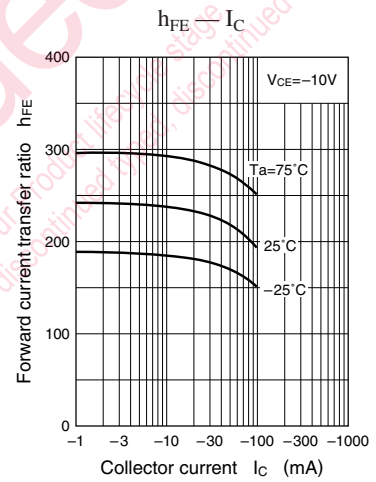
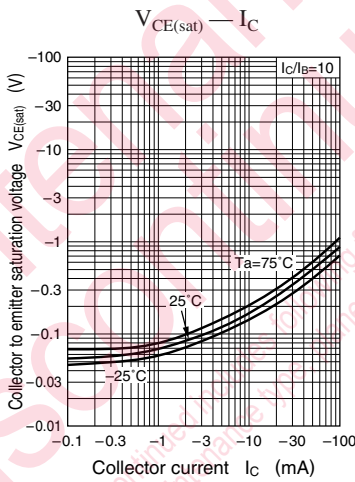
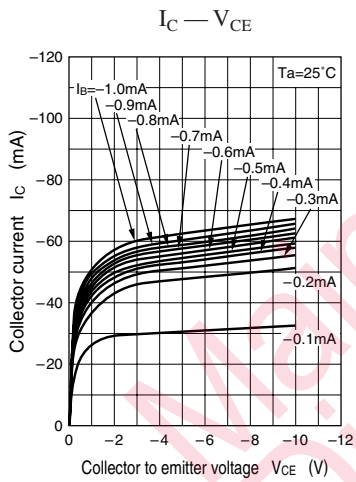


Characteristics charts of UNR9119

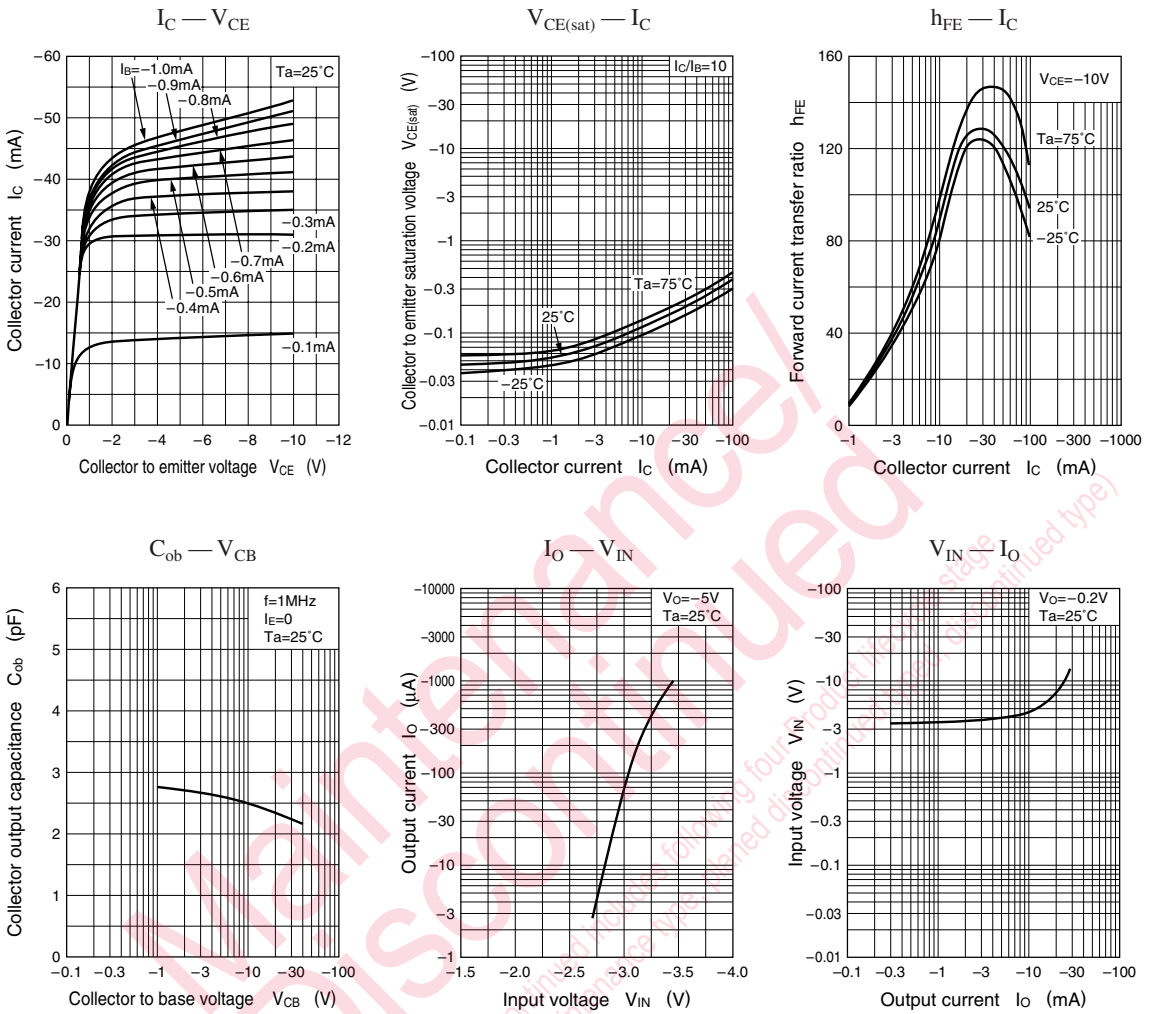




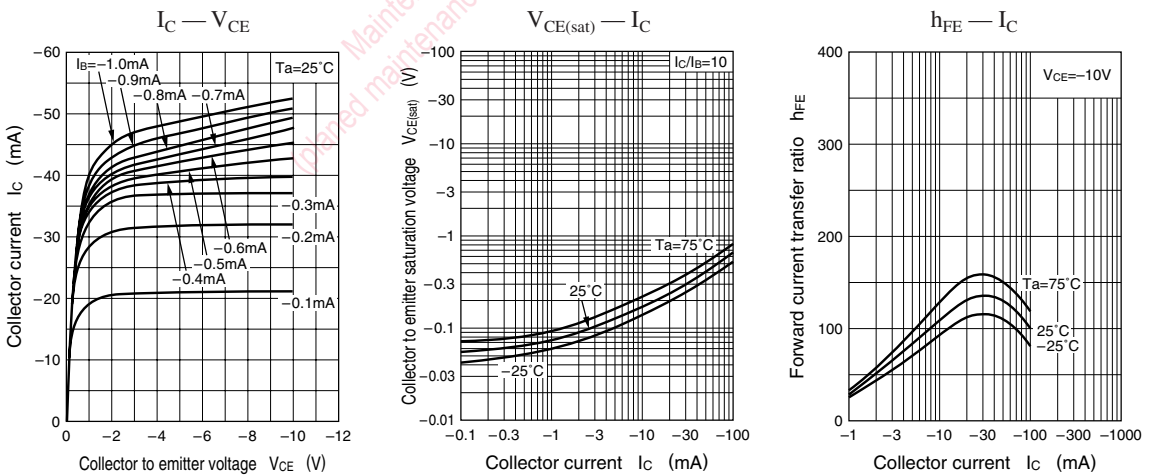
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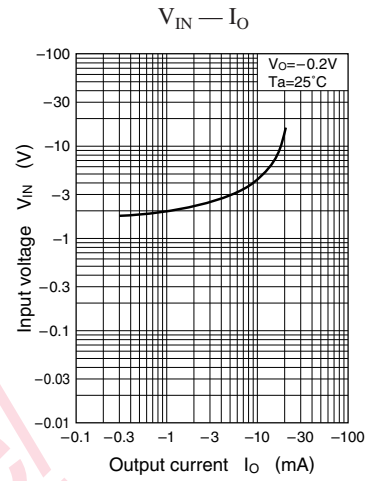
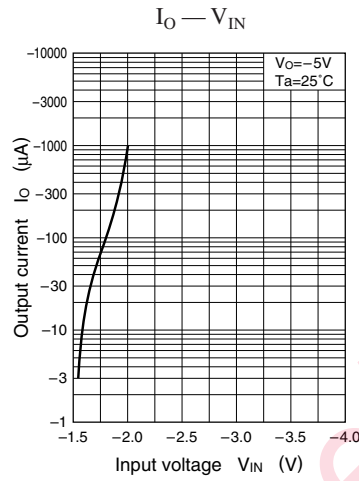
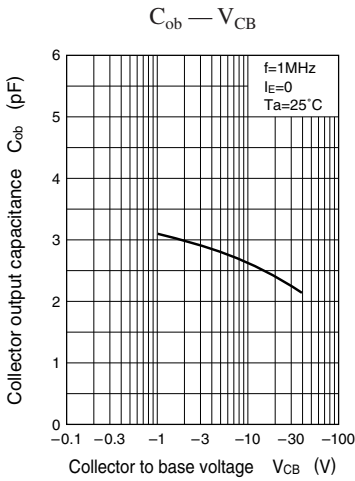


Characteristics charts of UNR911D

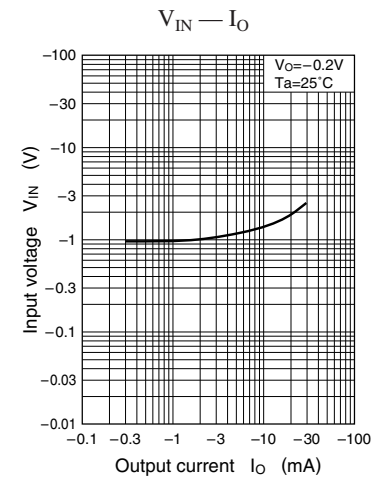
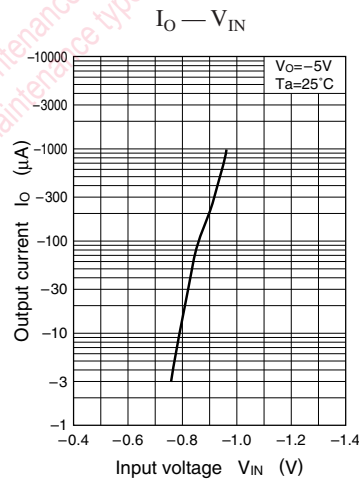
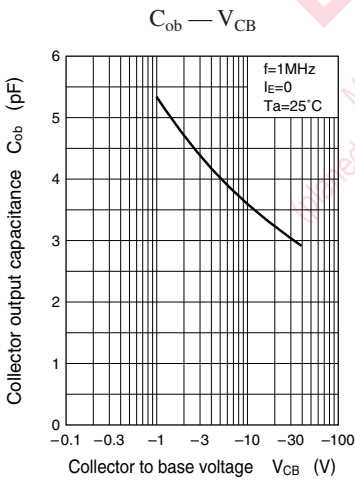
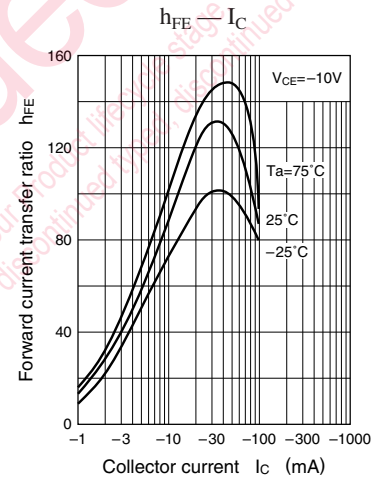
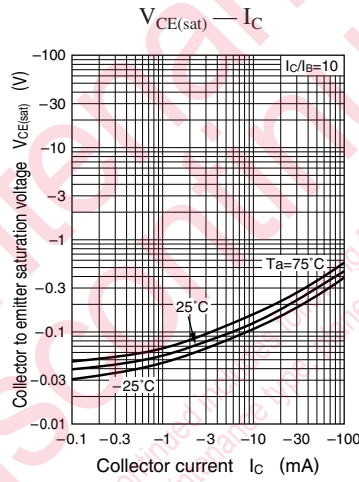
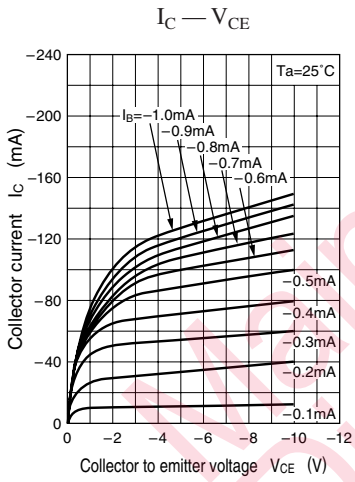


Characteristics charts of UNR911E

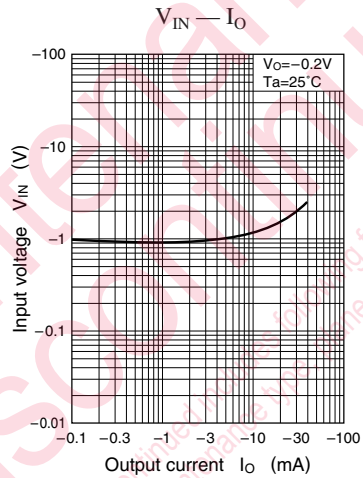
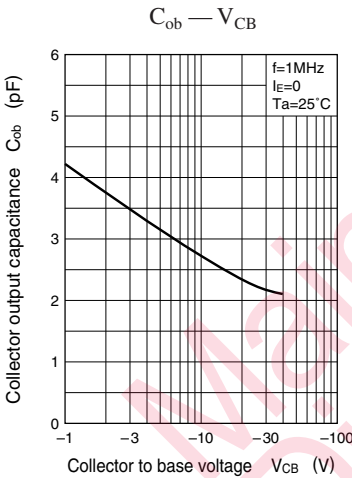
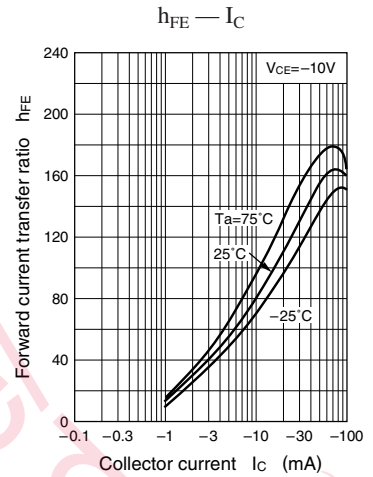
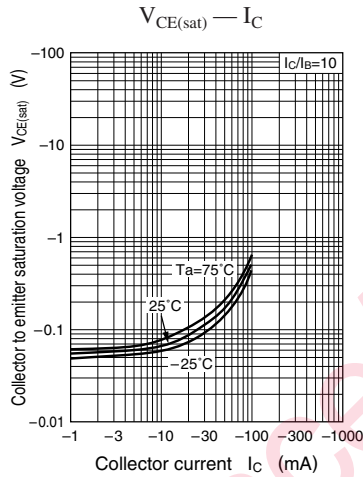
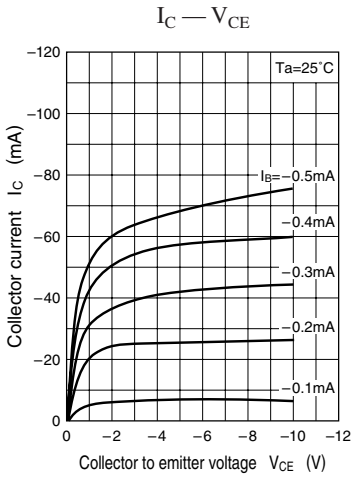




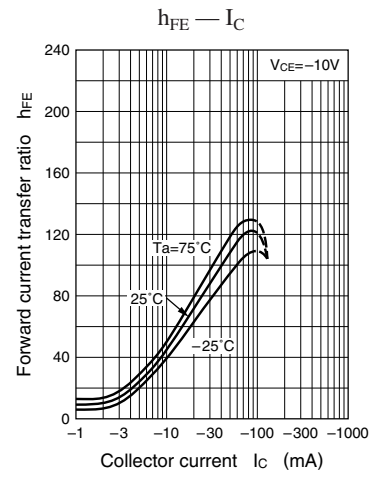
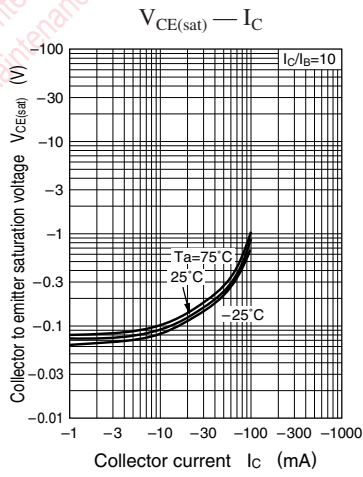
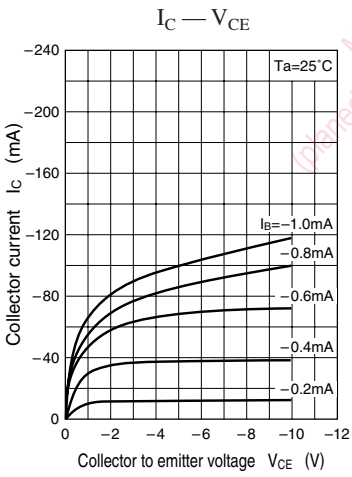
Characteristics charts of UNR911F

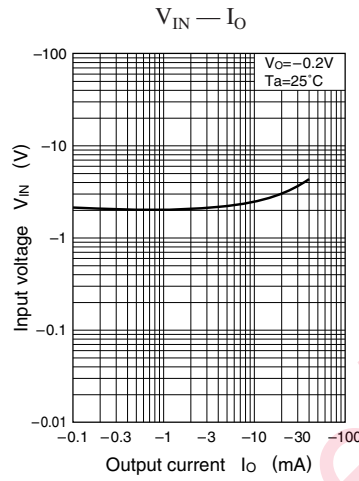
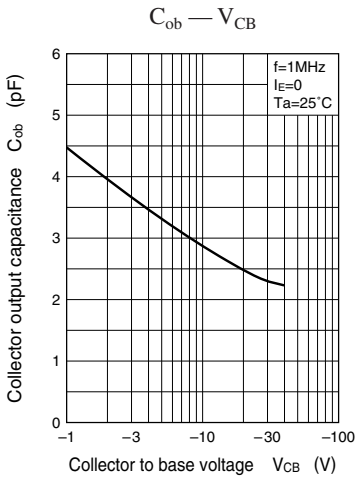


Characteristics charts of UNR911H



Characteristics charts of UNR911L





Maintenance/Discontinued

Maintenance/Discontinued includes following four Product lifecycle stage.
 (planned maintenance type, maintenance type, planned discontinued type, discontinued type)

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

- (1) If any of the products or technical information described in this book is to be exported or provided to non-residents, the laws and regulations of the exporting country, especially, those with regard to security export control, must be observed.
- (2) The technical information described in this book is intended only to show the main characteristics and application circuit examples of the products, and no license is granted under any intellectual property right or other right owned by our company or any other company. Therefore, no responsibility is assumed by our company as to the infringement upon any such right owned by any other company which may arise as a result of the use of technical information described in this book.
- (3) The products described in this book 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.
- (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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