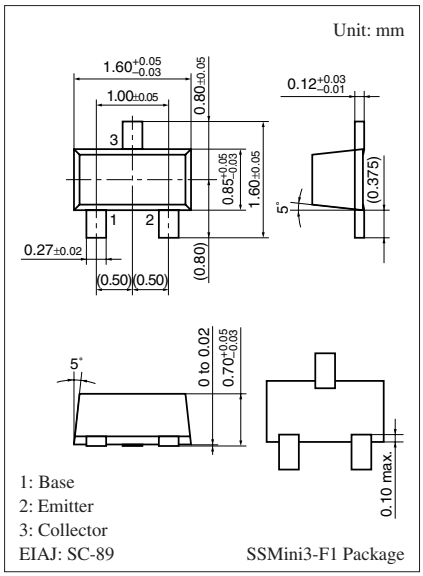
UNR921xJ Series (UN921xJ Series)

Silicon NPN epitaxial planar type

For digital circuits



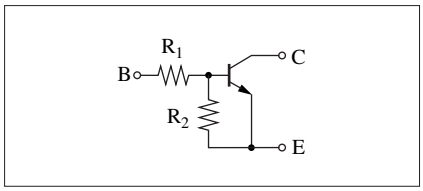
■ Features

- 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

Internal Connection



■ 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

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

■ Electrical Characteristics $T_a = 25°C \pm 3°C$

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)		V_{CBO}	$I_C = 10\ \mu A$, $I_E = 0$	50			V
Collector-emitter voltage (Base open)		V_{CEO}	$I_C = 2$ mA, $I_B = 0$	50			V
Collector-base cut-off current (Emitter open)		I_{CBO}	$V_{CB} = 50$ V, $I_E = 0$			0.1	μA
Collector-emitter cut-off current (Base open)		I_{CEO}	$V_{CE} = 50$ V, $I_B = 0$			0.5	μA
Emitter-base cut-off current (Collector open)	UNR9210J/9215J/9216J/9217J/921BJ	I_{EBO}	$V_{EB} = 6$ 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}	$V_{CE} = 10$ V, $I_C = 5$ 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		$V_{CE(sat)}$	$I_C = 10$ mA, $I_B = 0.3$ mA			0.25	V
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
	UNR9213J/921BJ/921KJ		$V_{CC} = 5$ V, $V_B = 3.5$ V, $R_L = 1$ kΩ				
	UNR921DJ		$V_{CC} = 5$ V, $V_B = 10$ V, $R_L = 1$ kΩ				
	UNR921EJ		$V_{CC} = 5$ V, $V_B = 6$ V, $R_L = 1$ kΩ				
	UNR921AJ		$V_{CC} = 5$ V, $V_B = 5$ V, $R_L = 1$ kΩ				
Transition frequency		f_T	$V_{CB} = 10$ V, $I_E = -2$ mA, f = 200 MHz		150		MHz
Input resistance	UNR9218J	R_1		−30%	0.51	+30%	kΩ
	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		

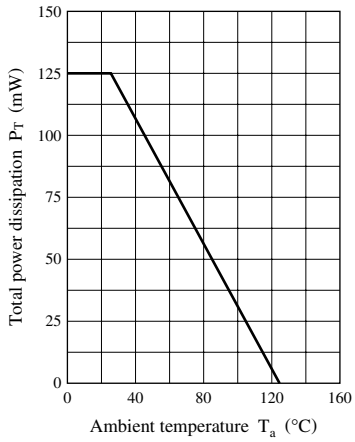
■ Electrical Characteristics (continued) $T_a = 25°C \pm 3°C$

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Emitter-base resistance	UNR921CJ	R_2		−30%	47	+30%	kΩ
Rasistance 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.

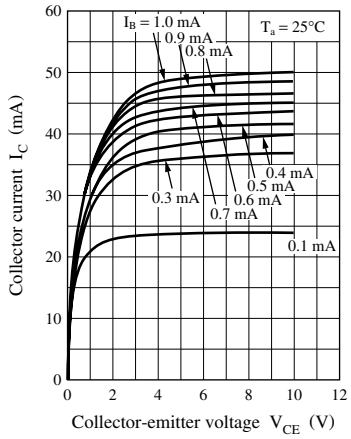
Common characteristics chart

P_T — T_a

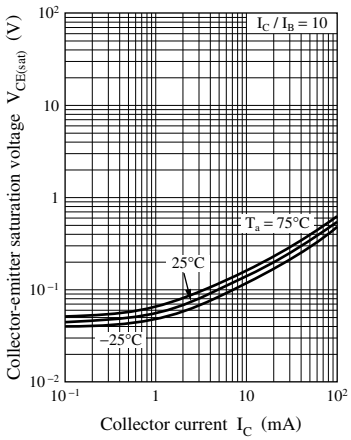


Characteristics charts of UNR9210J

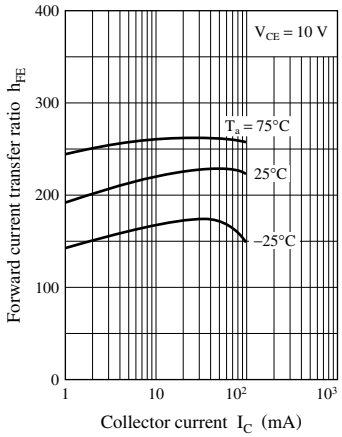
I_C — V_{CE}

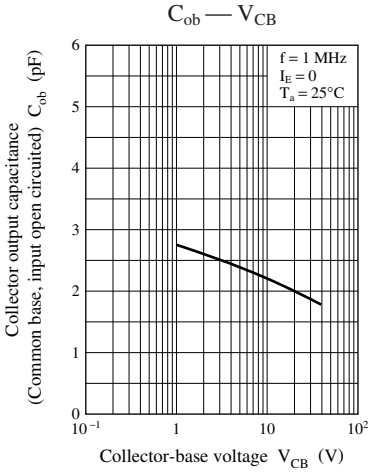


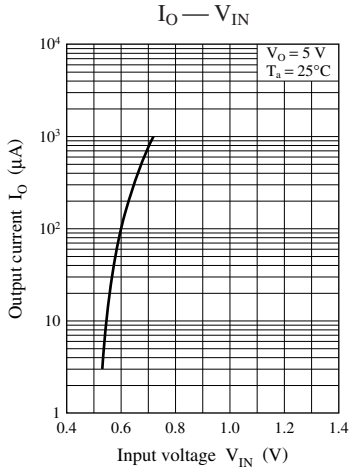
$V_{CE(sat)}$ — I_C

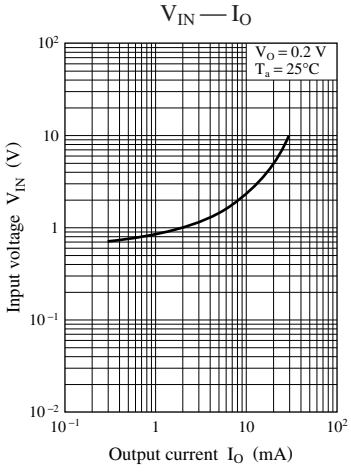


h_{FE} — I_C

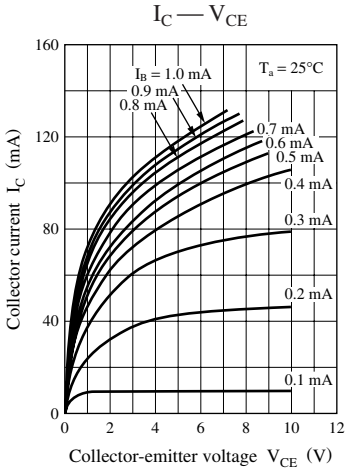


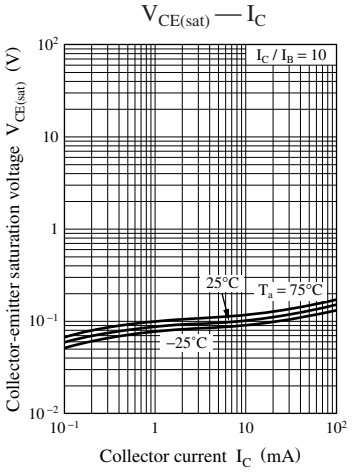


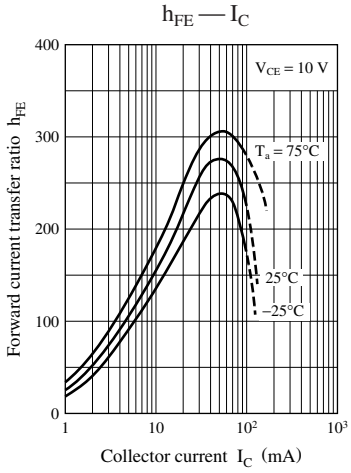


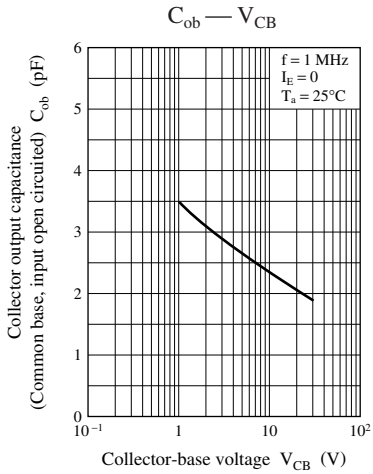


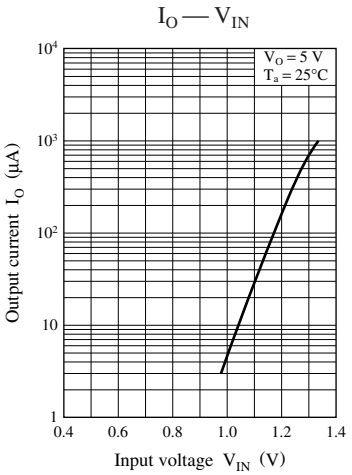
Characteristics charts of UNR9211J

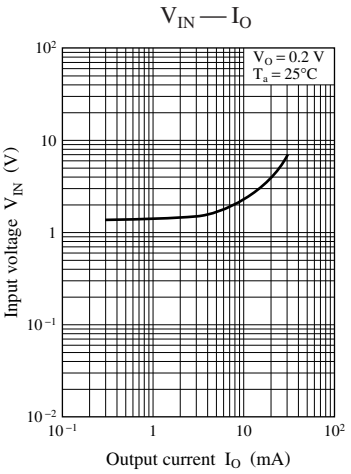






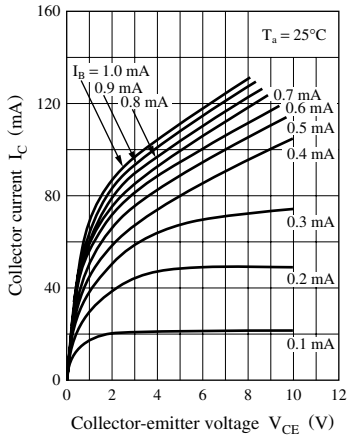




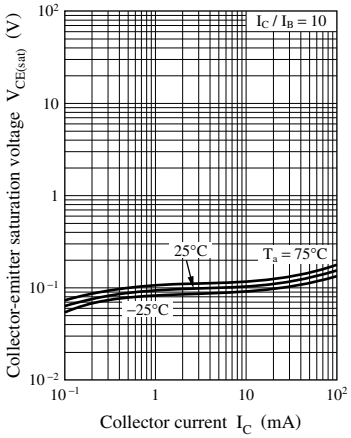


Characteristics charts of UNR9212J

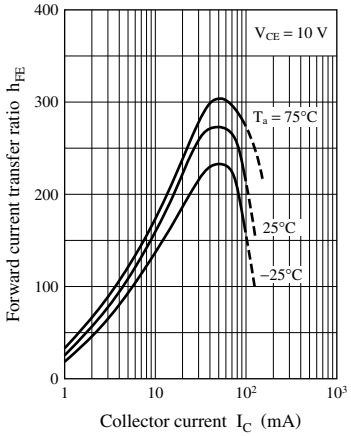
I_C — V_{CE}



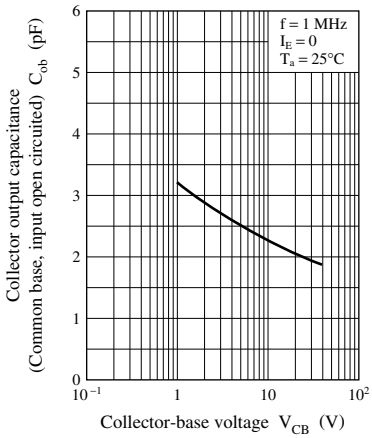
$V_{CE(sat)}$ — I_C



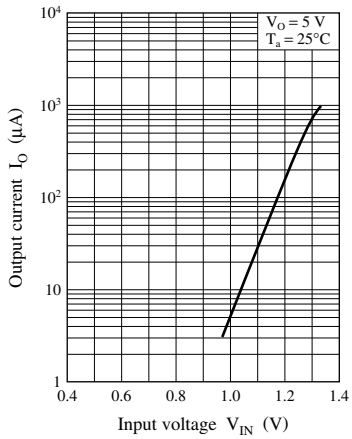
h_{FE} — I_C



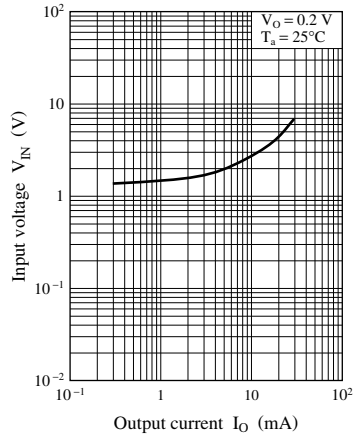
C_{ob} — V_{CB}



I_O — V_{IN}

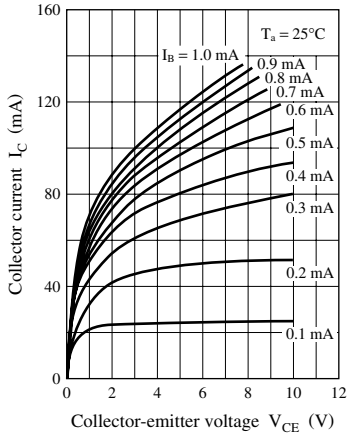


V_{IN} — I_O

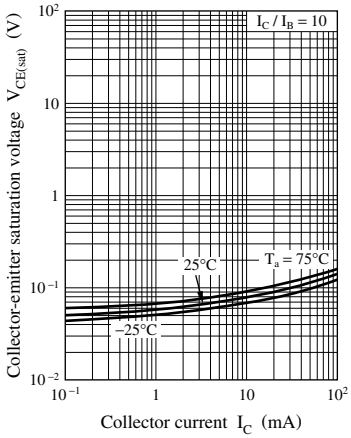


Characteristics charts of UNR9213J

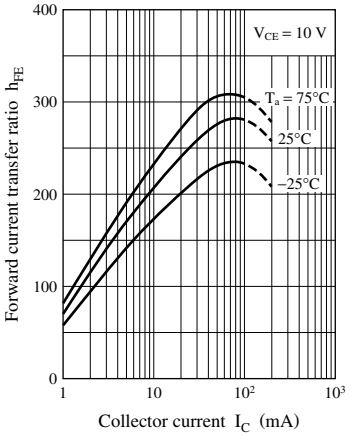
I_C — V_{CE}

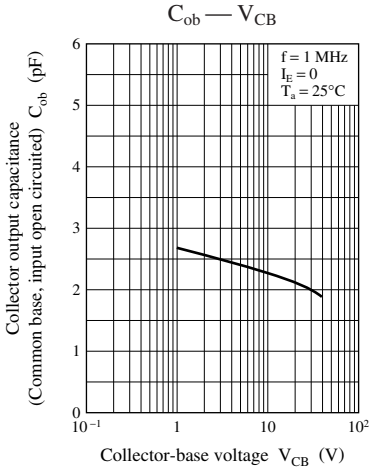


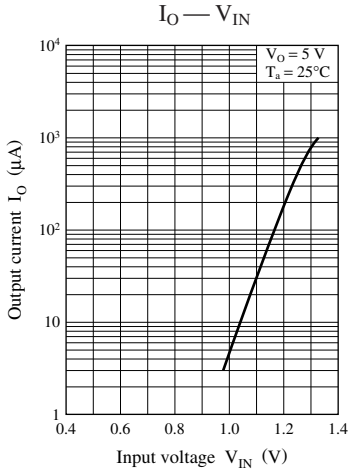
$V_{CE(sat)}$ — I_C

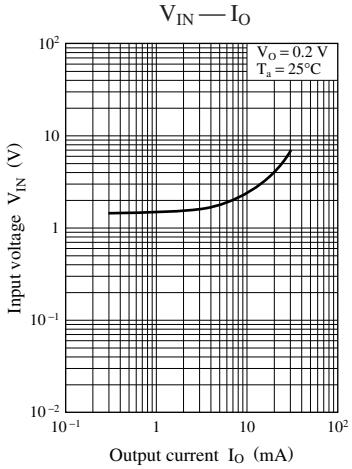


h_{FE} — I_C

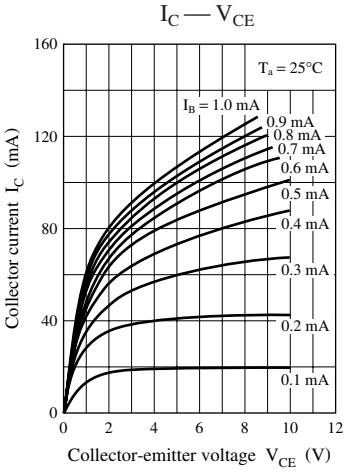


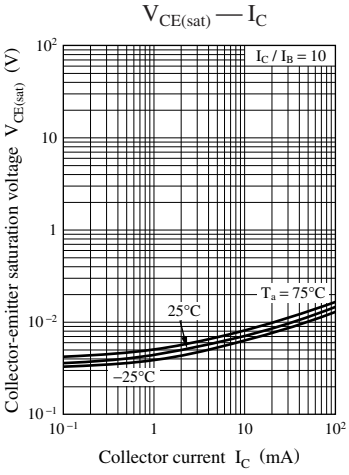


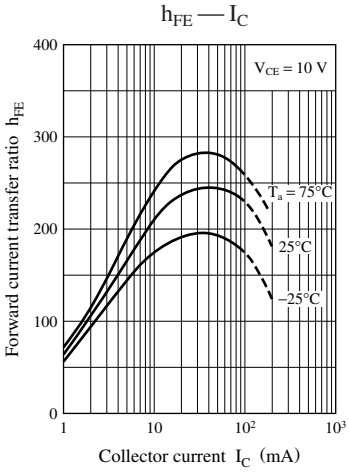


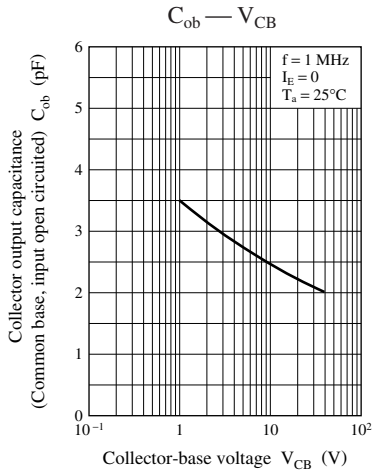


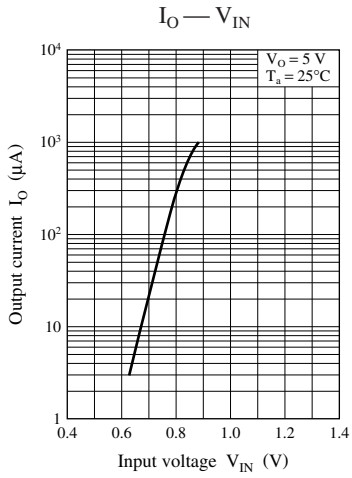
Characteristics charts of UNR9214J

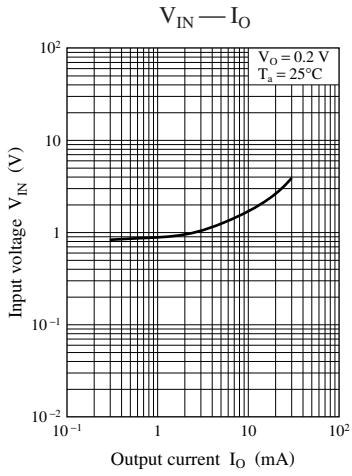






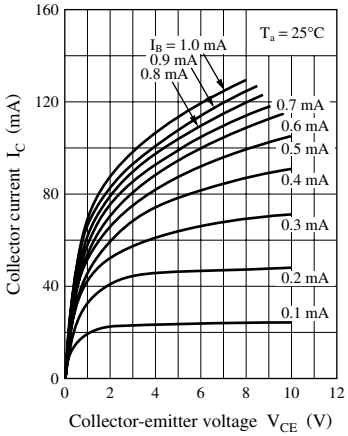




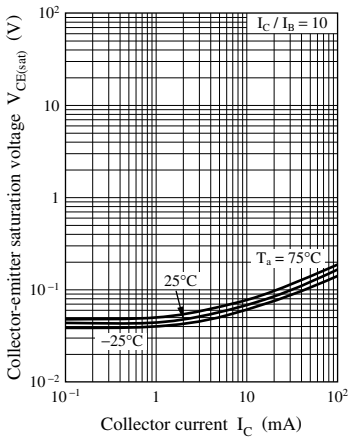


Characteristics charts of UNR9215J

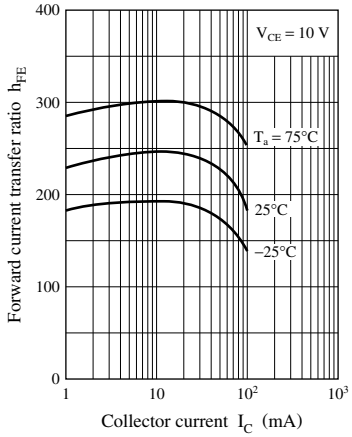
I_C — V_{CE}



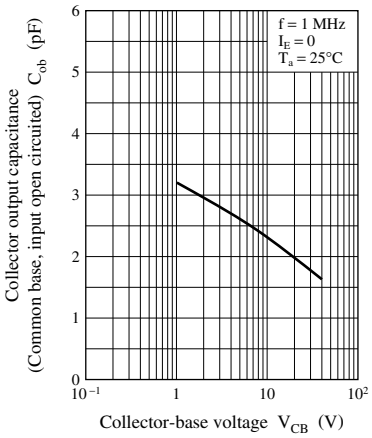
$V_{CE(sat)}$ — I_C



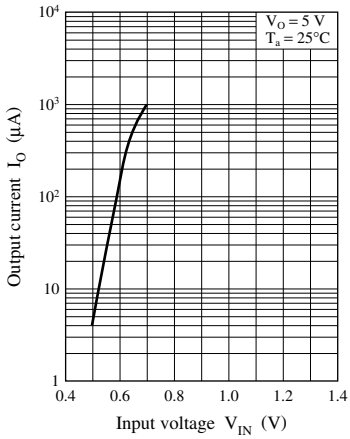
h_{FE} — I_C



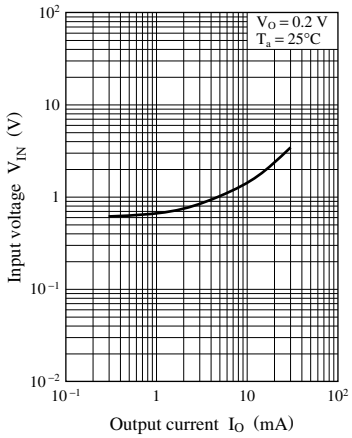
C_{ob} — V_{CB}



I_O — V_{IN}

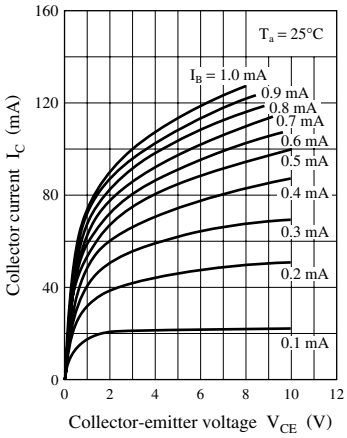


V_{IN} — I_O

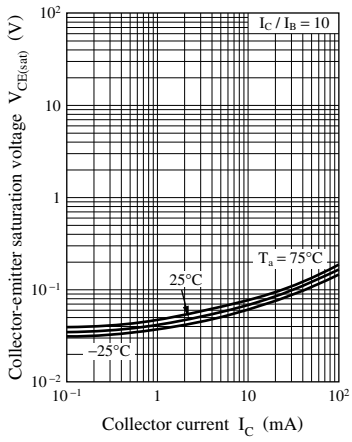


Characteristics charts of UNR9216J

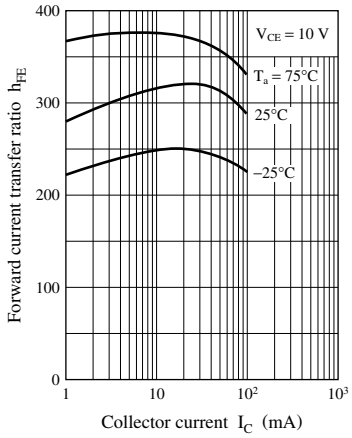
I_C — V_{CE}



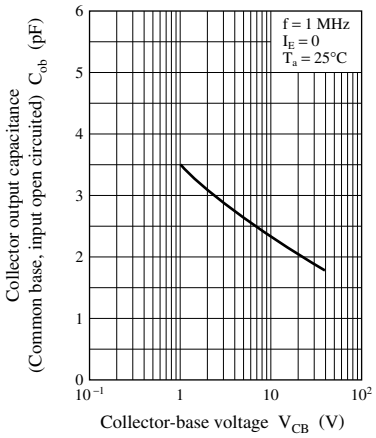
$V_{CE(sat)}$ — I_C



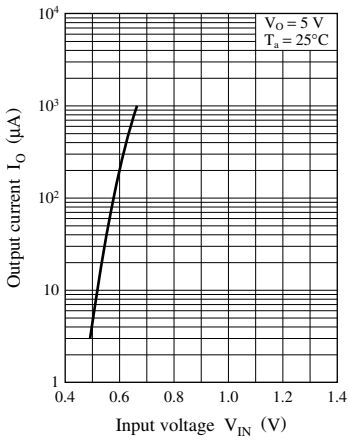
h_{FE} — I_C



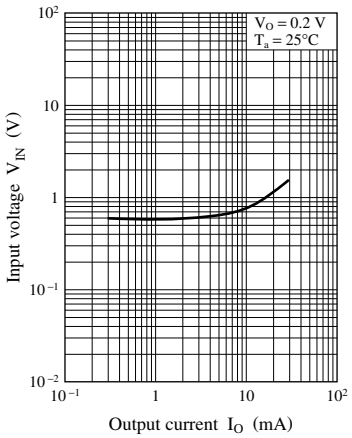
C_{ob} — V_{CB}



I_O — V_{IN}

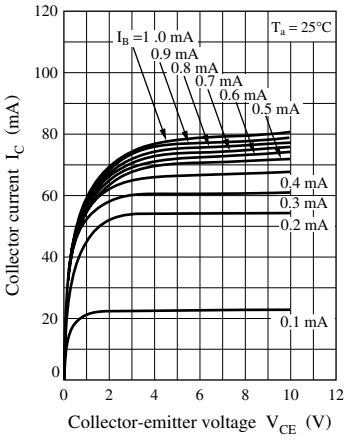


V_{IN} — I_O

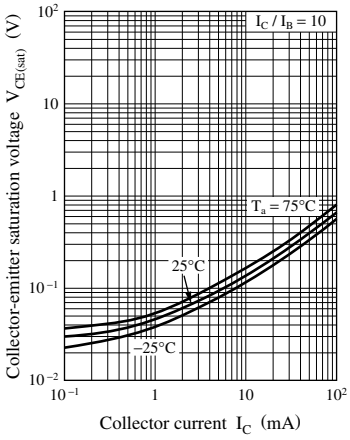


Characteristics charts of UNR9217J

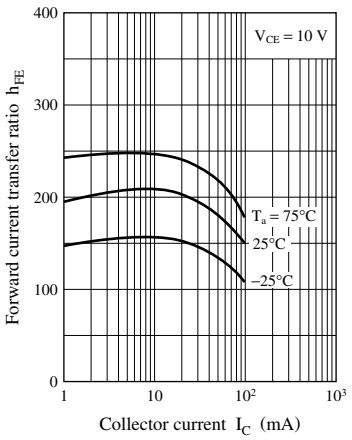
I_C — V_{CE}



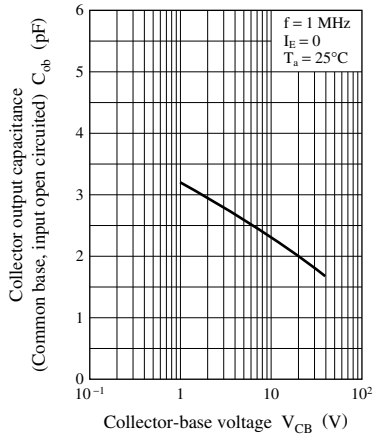
$V_{CE(sat)}$ — I_C



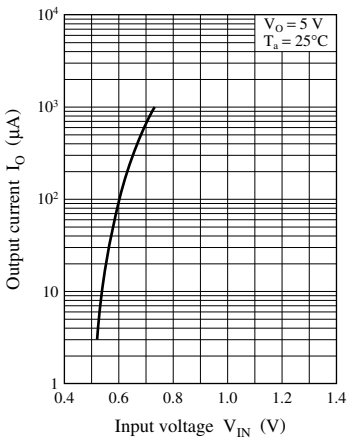
h_{FE} — I_C



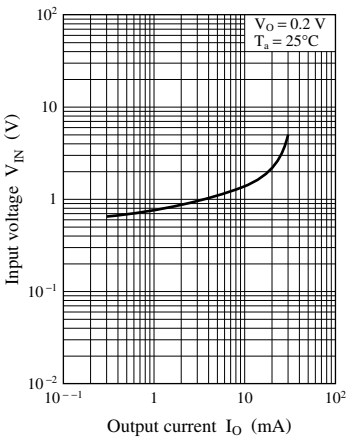
C_{ob} — V_{CB}



I_O — V_{IN}

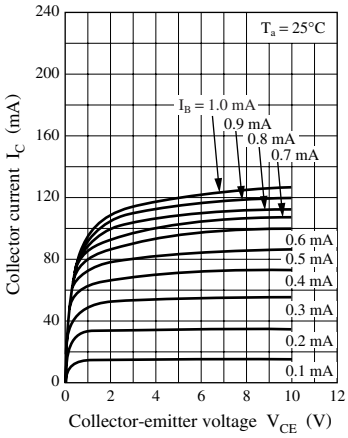


V_{IN} — I_O

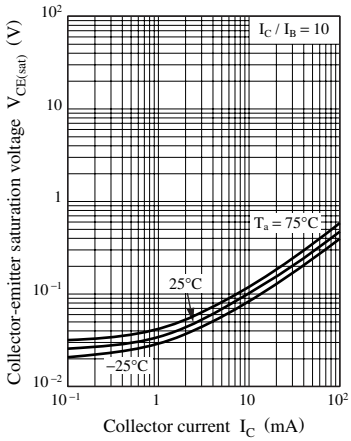


Characteristics charts of UNR9218J

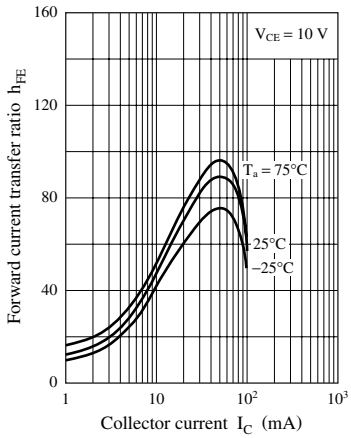
I_C — V_{CE}



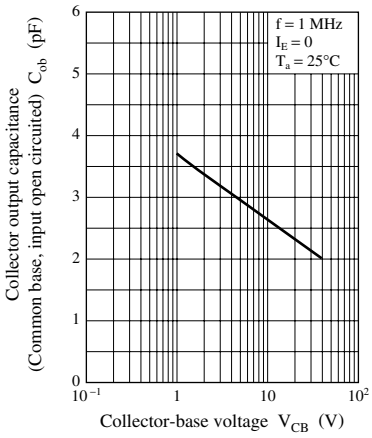
$V_{CE(sat)}$ — I_C



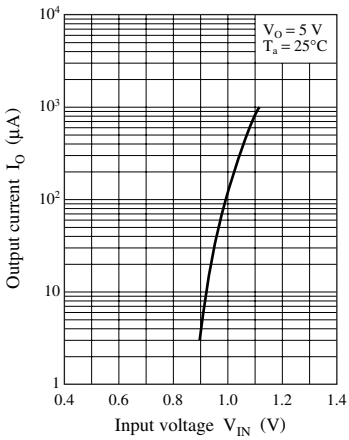
h_{FE} — I_C



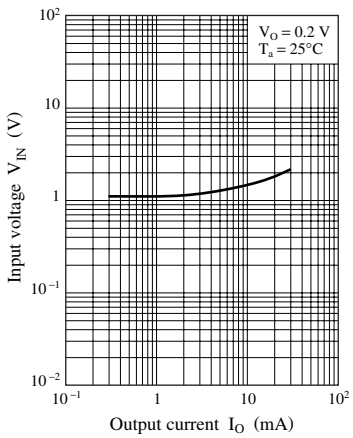
C_{ob} — V_{CB}



I_O — V_{IN}

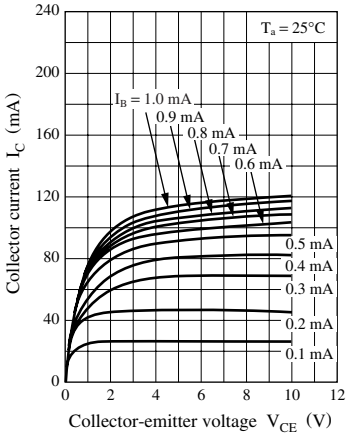


V_{IN} — I_O

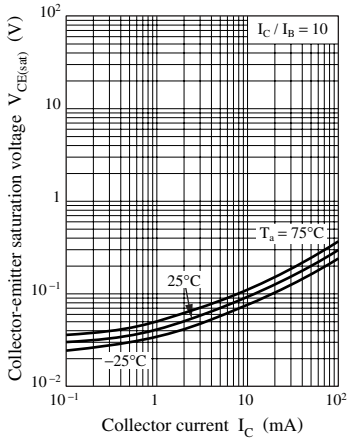


Characteristics charts of UNR9219J

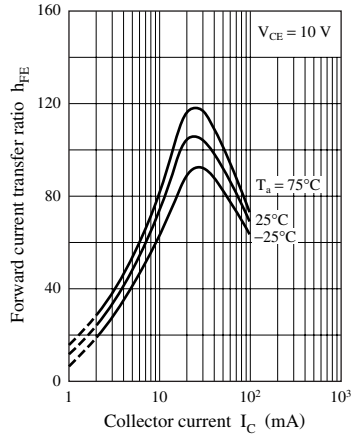
I_C — V_{CE}

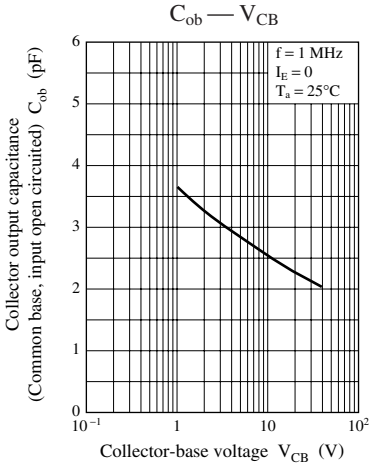


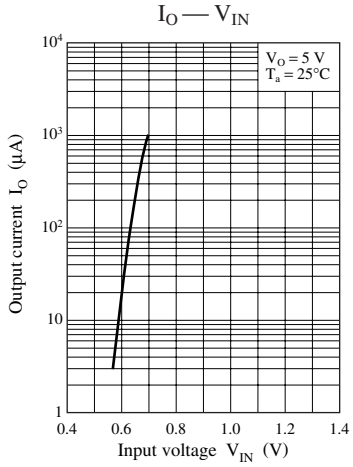
$V_{CE(sat)}$ — I_C

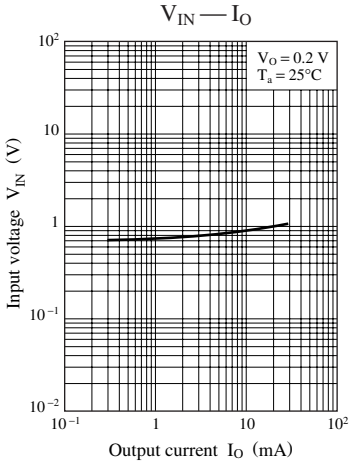


h_{FE} — I_C

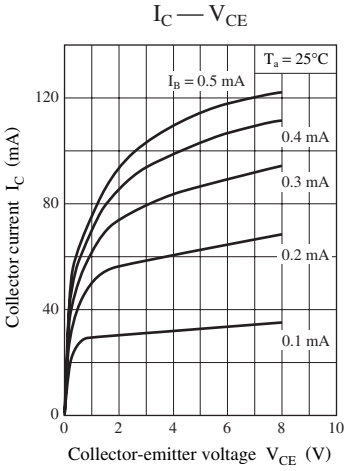


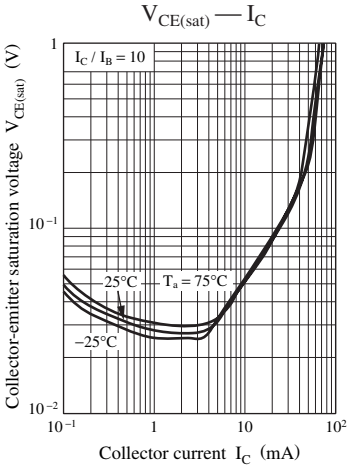


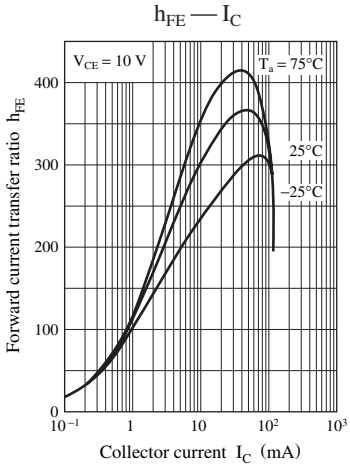


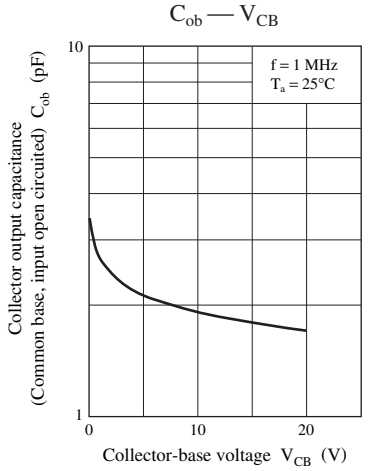


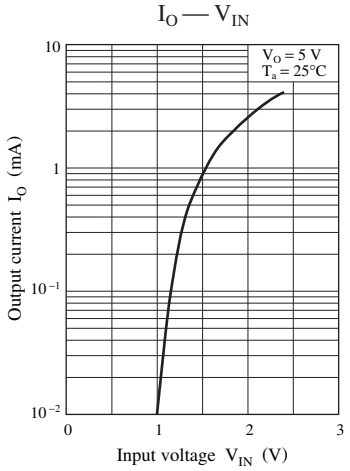
Characteristics charts of UNR921AJ

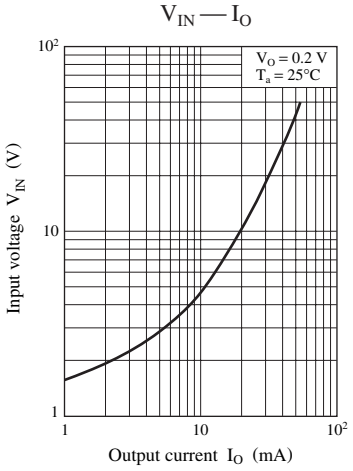






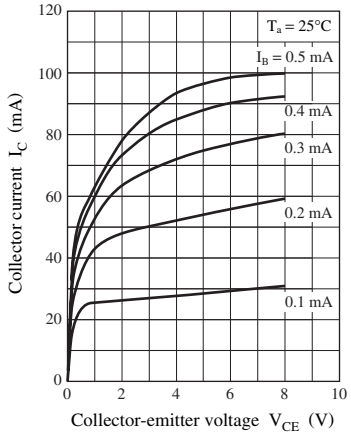




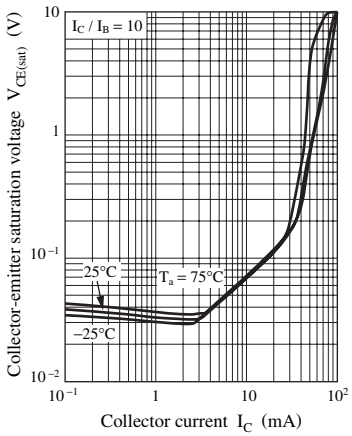


Characteristics charts of UNR921BJ

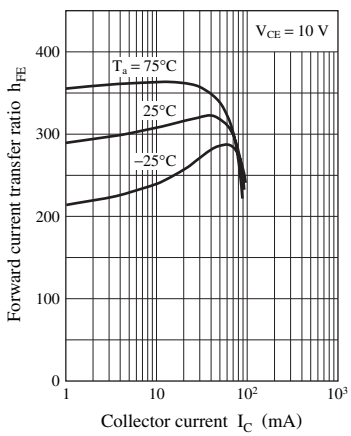
I_C — V_{CE}



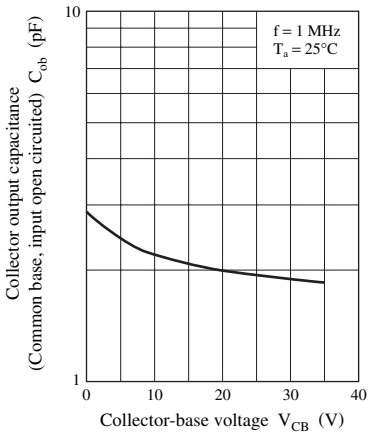
$V_{CE(sat)}$ — I_C



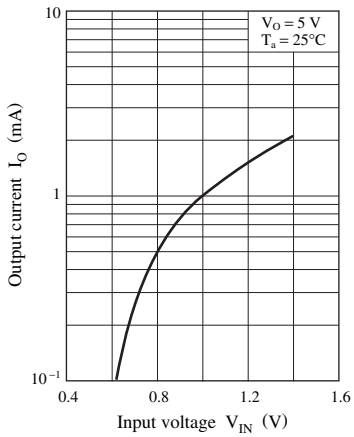
h_{FE} — I_C



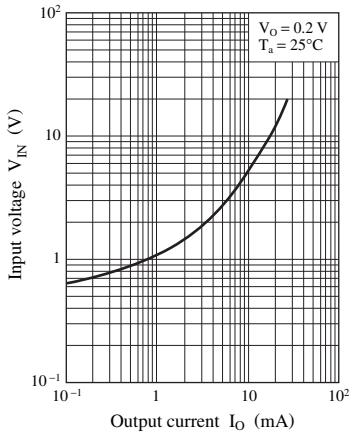
C_{ob} — V_{CB}



I_O — V_{IN}

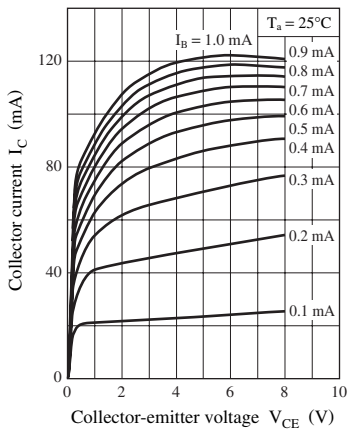


V_{IN} — I_O

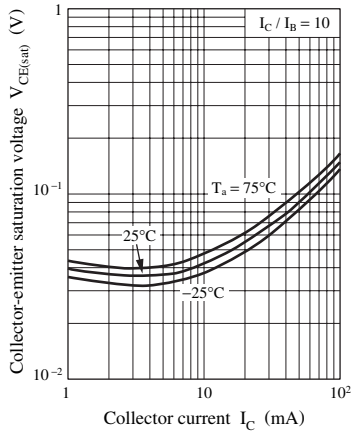


Characteristics charts of UNR921CJ

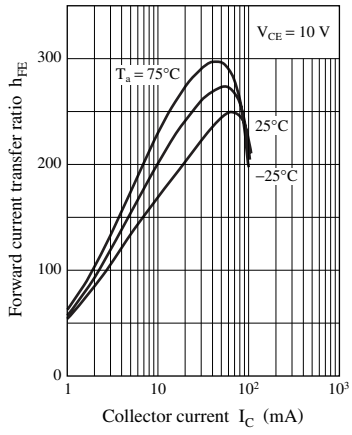
I_C — V_{CE}



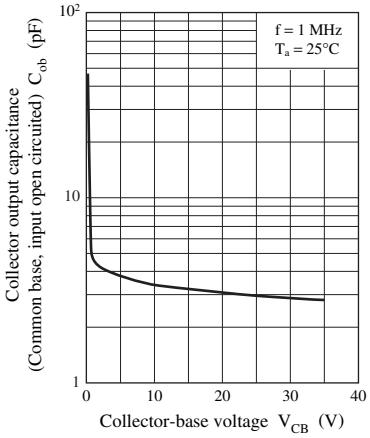
$V_{CE(sat)}$ — I_C



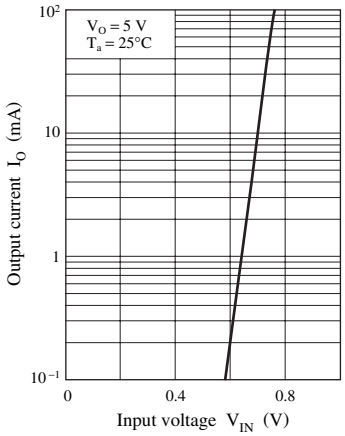
h_{FE} — I_C



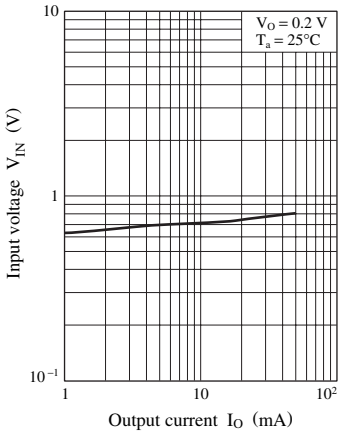
C_{ob} — V_{CB}



I_O — V_{IN}

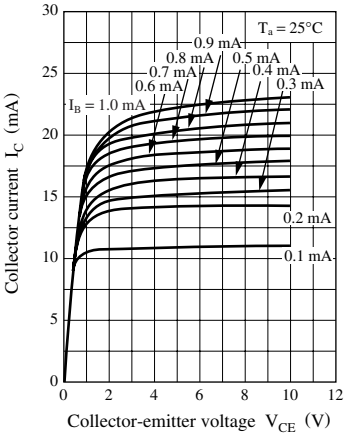


V_{IN} — I_O

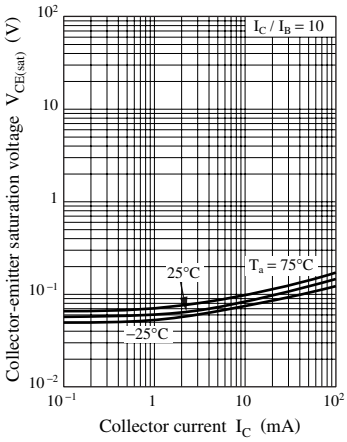


Characteristics charts of UNR921DJ

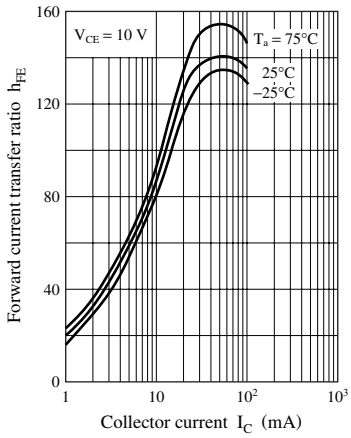
I_C — V_{CE}



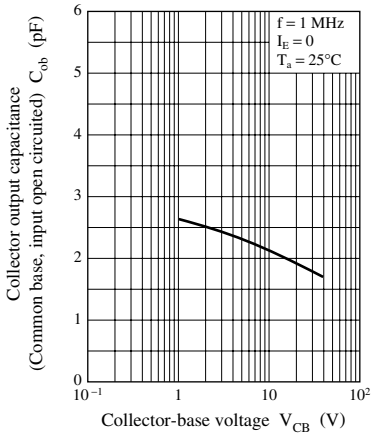
$V_{CE(sat)}$ — I_C



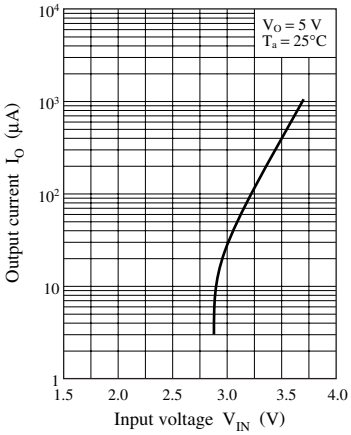
h_{FE} — I_C



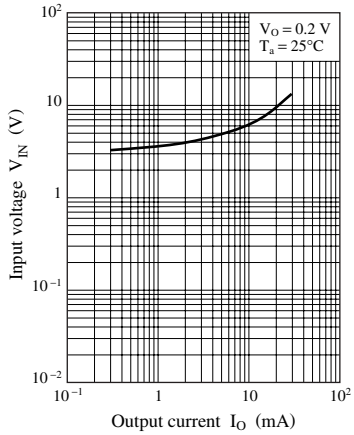
C_{ob} — V_{CB}



I_O — V_{IN}

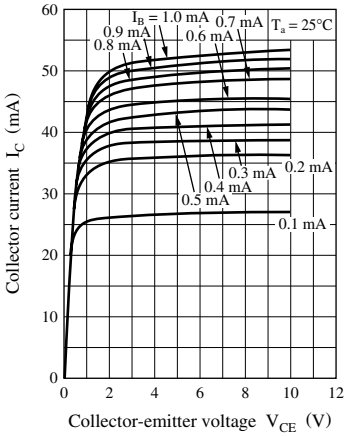


V_{IN} — I_O

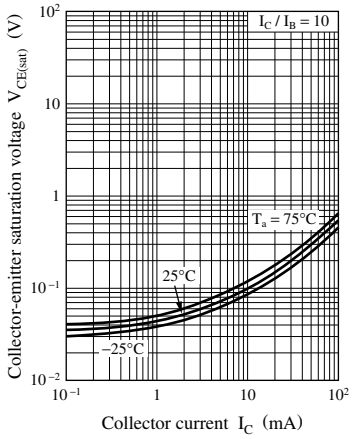


Characteristics charts of UNR921EJ

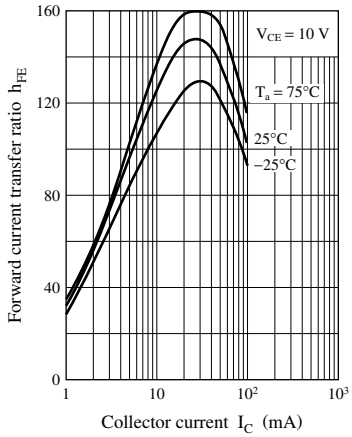
I_C — V_{CE}



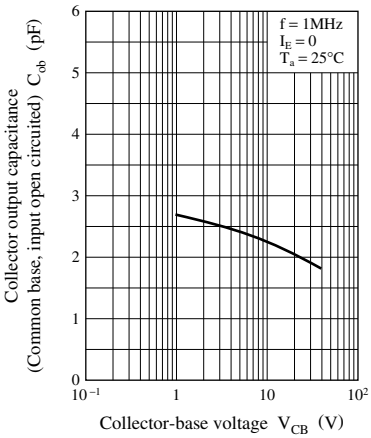
$V_{CE(sat)}$ — I_C



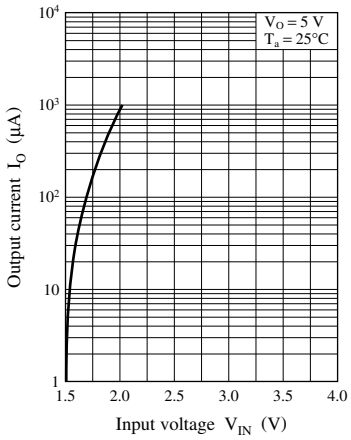
h_{FE} — I_C



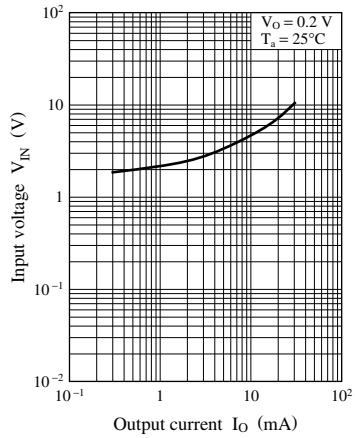
C_{ob} — V_{CB}



I_O — V_{IN}

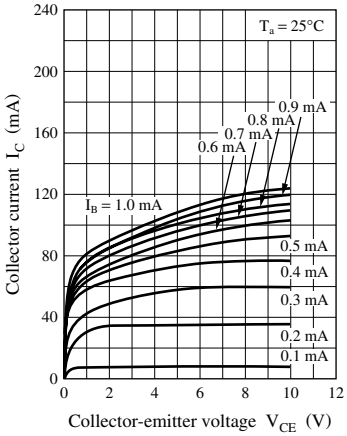


V_{IN} — I_O

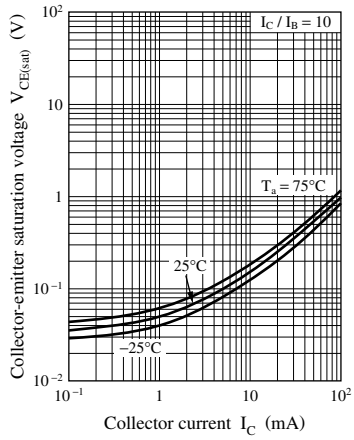


Characteristics charts of UNR921FJ

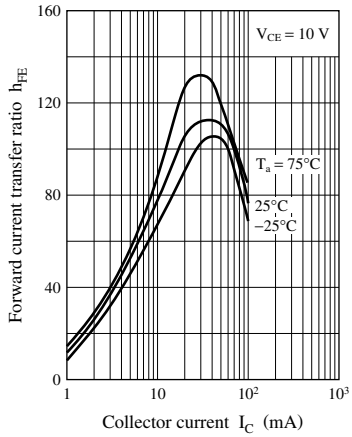
I_C — V_{CE}

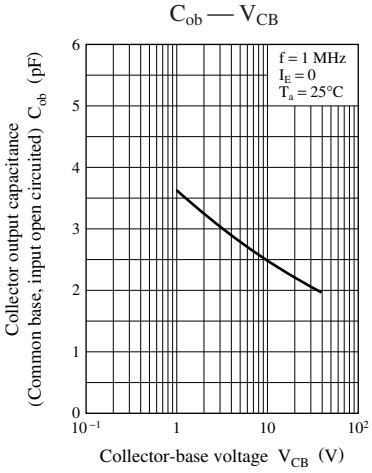


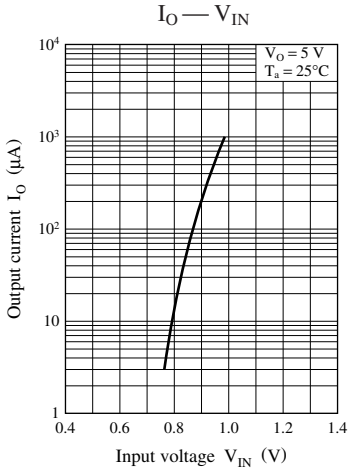
$V_{CE(sat)}$ — I_C

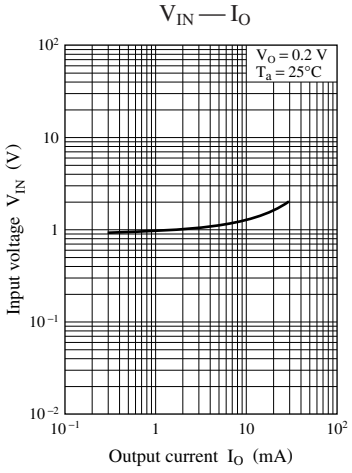


h_{FE} — I_C

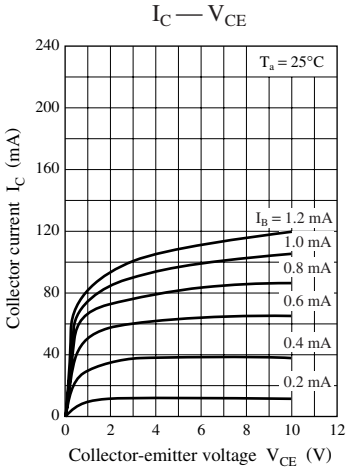


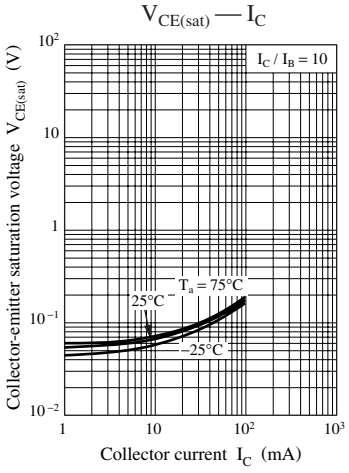


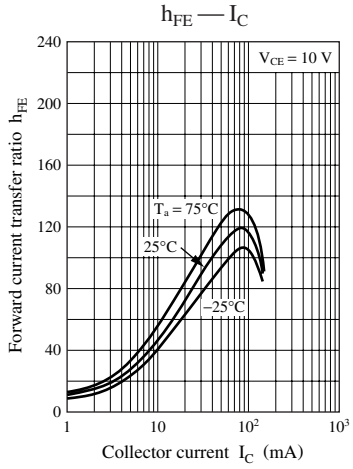


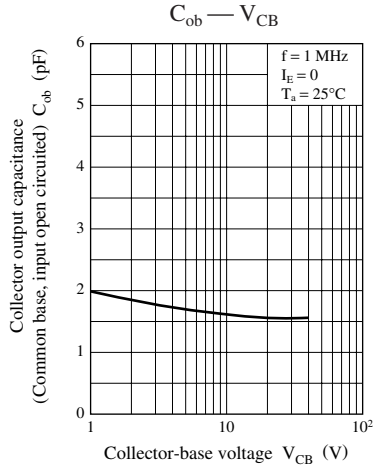


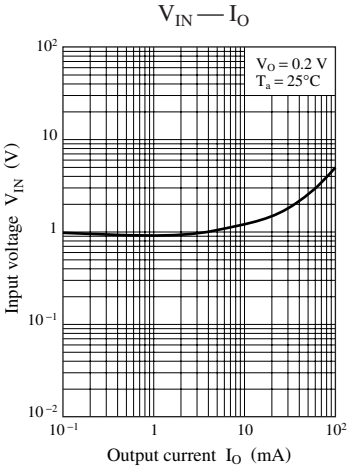
Characteristics charts of UNR921KJ





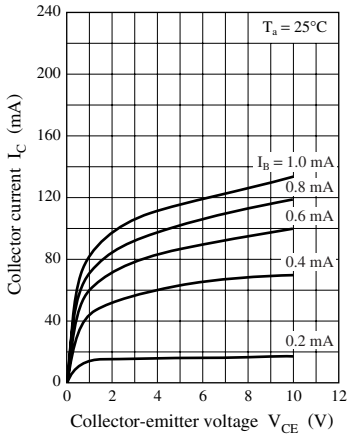




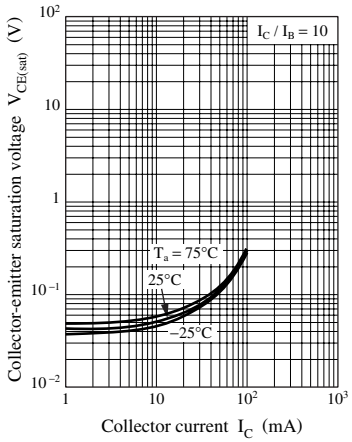


Characteristics charts of UNR921LJ

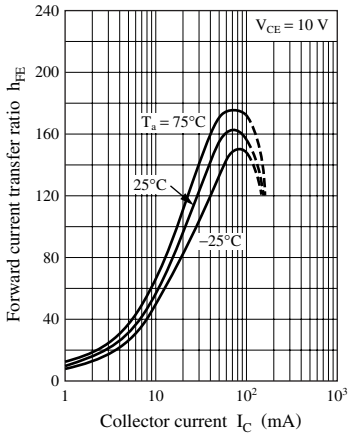
I_C — V_{CE}



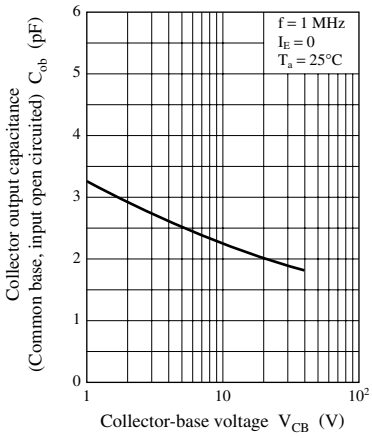
$V_{CE(sat)}$ — I_C



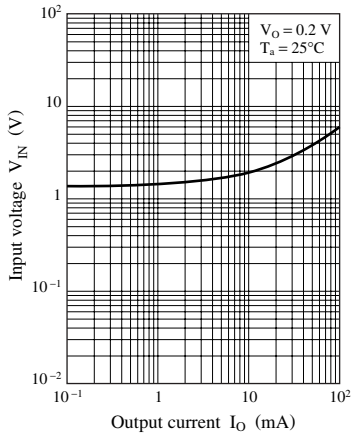
h_{FE} — I_C



C_{ob} — V_{CB}

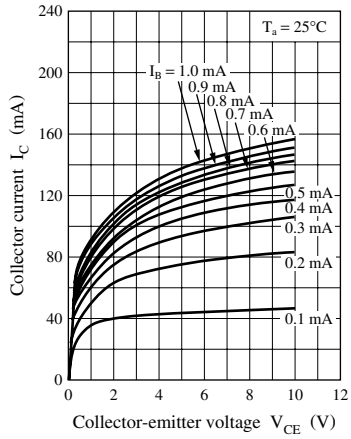


V_{IN} — I_O

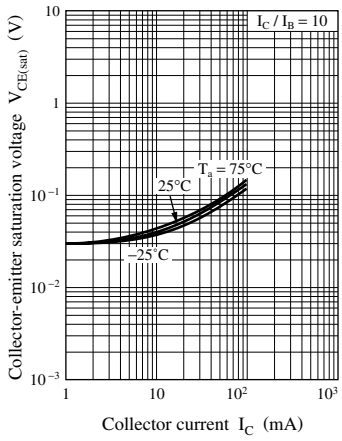


Characteristics charts of UNR921MJ

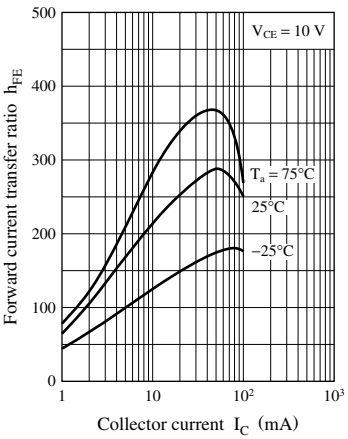
I_C — V_{CE}

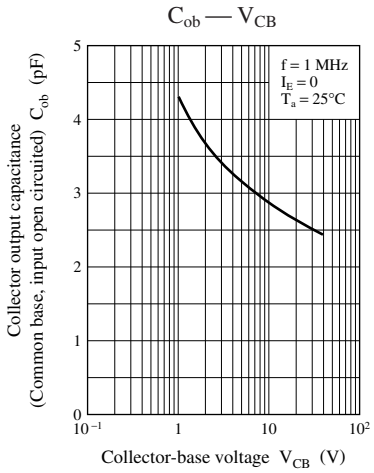


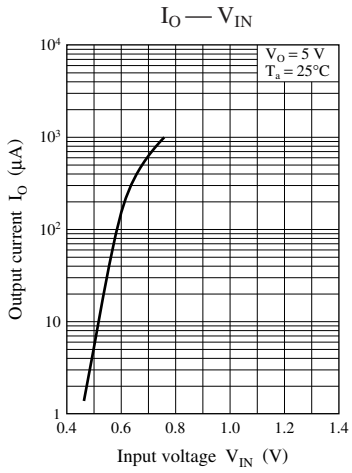
$V_{CE(sat)}$ — I_C

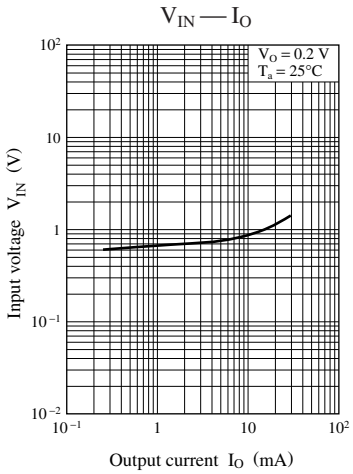


h_{FE} — I_C

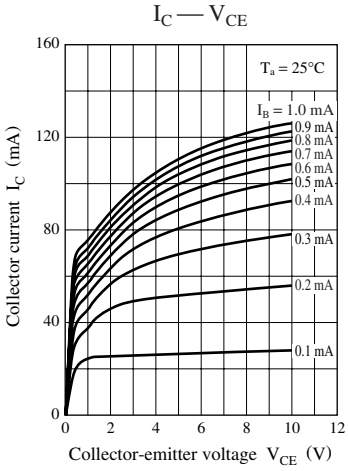


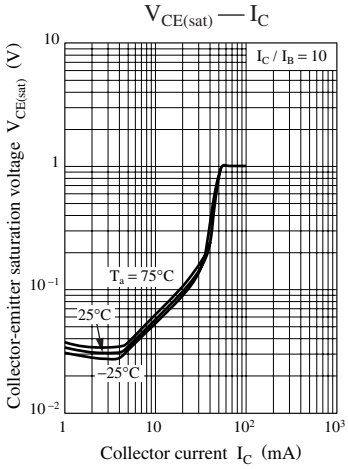


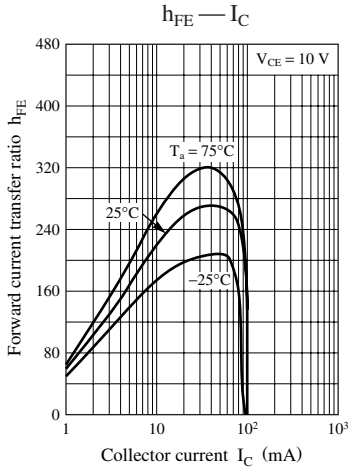


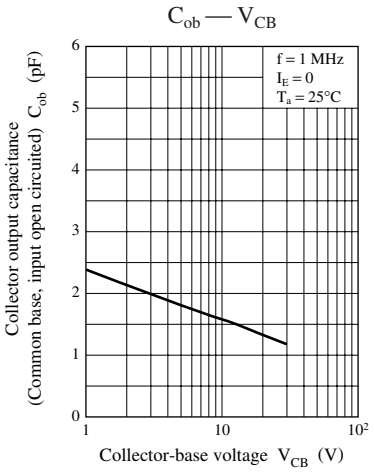


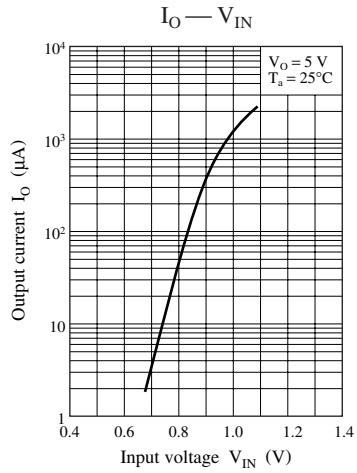
Characteristics charts of UNR921NJ

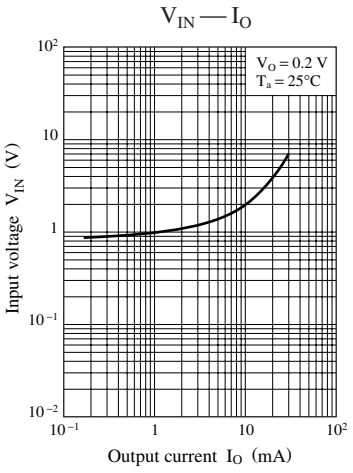






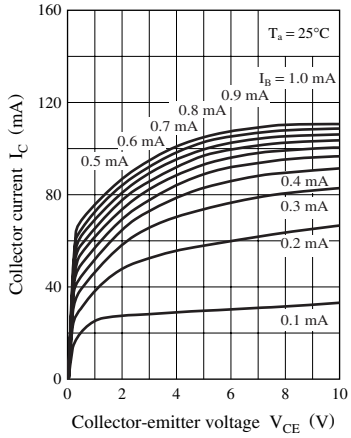




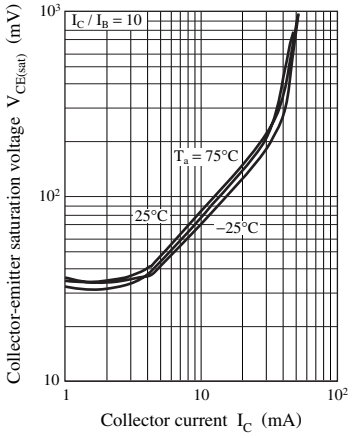


Characteristics charts of UNR921TJ

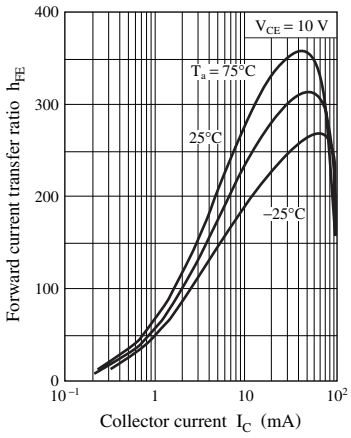
I_C — V_{CE}



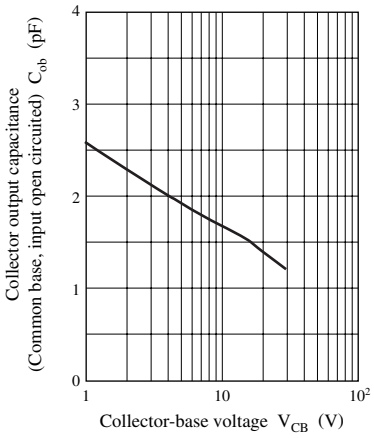
$V_{CE(sat)}$ — I_C



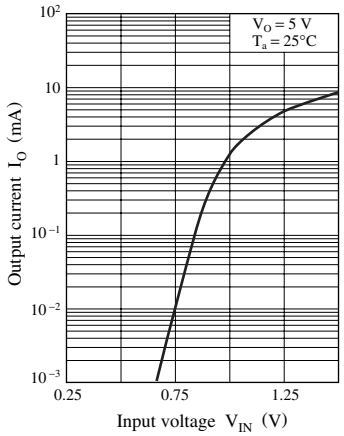
h_{FE} — I_C



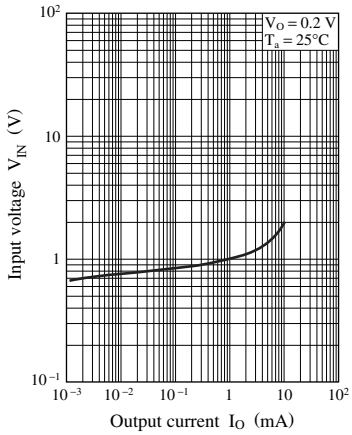
C_{ob} — V_{CB}



I_O — V_{IN}

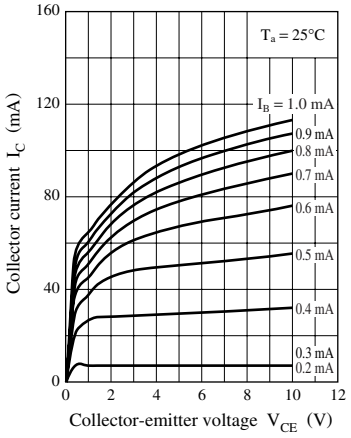


V_{IN} — I_O

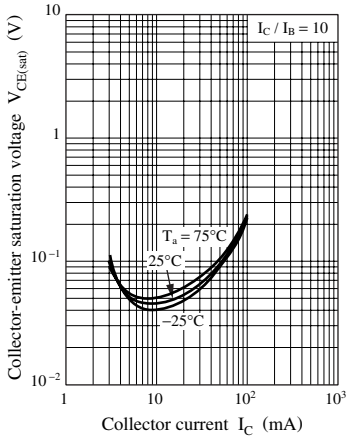


Characteristics charts of UNR921VJ

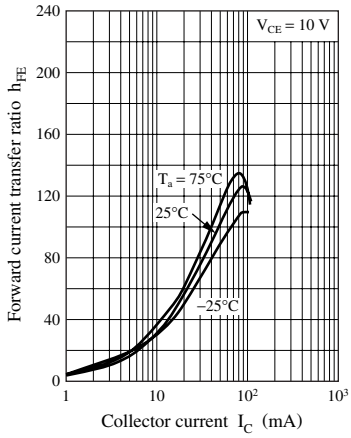
I_C — V_{CE}

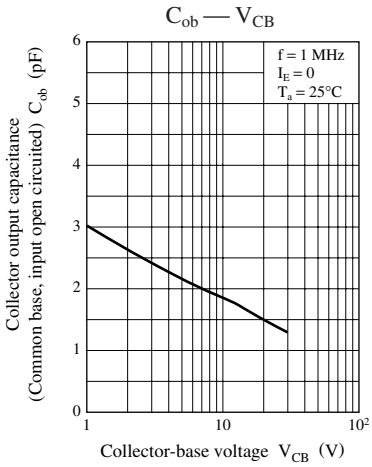


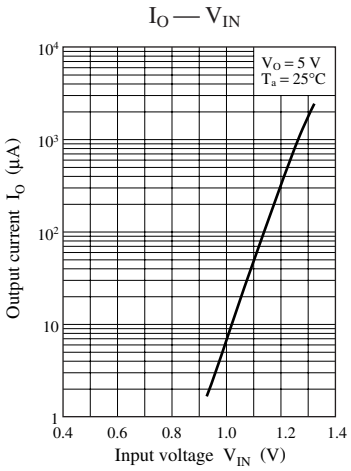
$V_{CE(sat)}$ — I_C

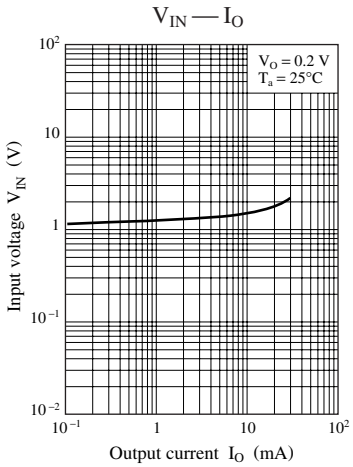


h_{FE} — I_C




C_{ob} — V_{CB}
f = 1 MHz
I_E = 0
T_a = 25°C
Collector output capacitance
(Common base, input open circuited) C_{ob} (pF)
Collector-base voltage V_{CB} (V)


I_O — V_{IN}
V_O = 5 V
T_a = 25°C
Output current I_O (μA)
Input voltage V_{IN} (V)


V_{IN} — I_O
V_O = 0.2 V
T_a = 25°C
Input voltage V_{IN} (V)
Output current I_O (mA)

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