

UN9211/9212/9213/9214/9215/9216/9217/9218/9219/9210/921D/ 921E/921F/921K/921L/UNR921M/921N/921AJ/921BJ/921CJ

Silicon NPN epitaxial planer transistor

For digital circuits

Features

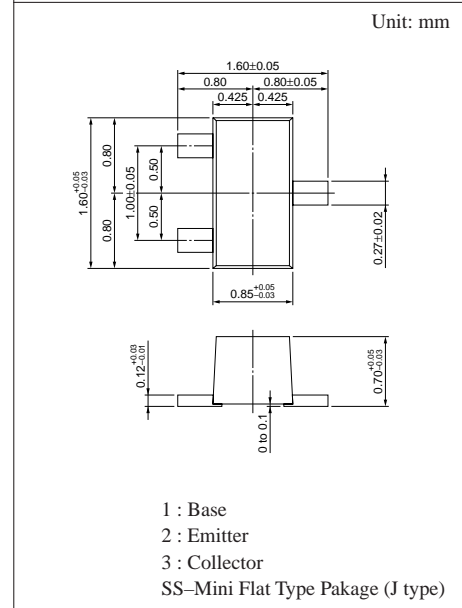
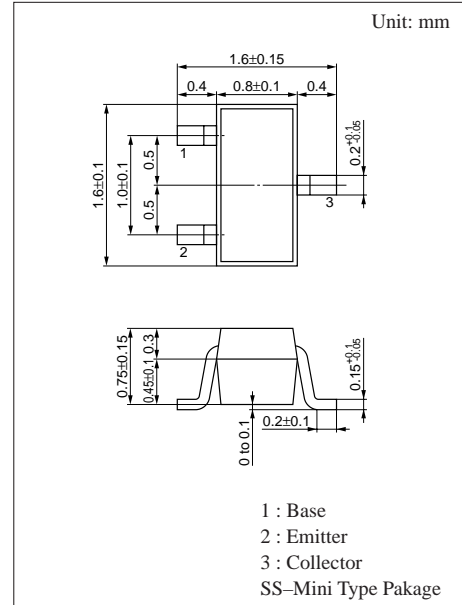
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts.
- SS-Mini type package, allowing automatic insertion through tape packing and magazine packing.

Resistance by Part Number

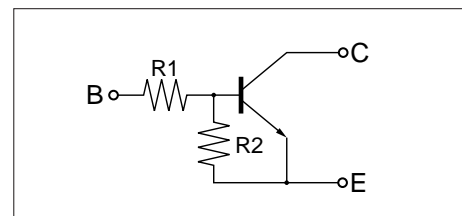
	Marking Symbol	(R ₁)	(R ₂)
• UN9211	8A	10kΩ	10kΩ
• UN9212	8B	22kΩ	22kΩ
• UN9213	8C	47kΩ	47kΩ
• UN9214	8D	10kΩ	47kΩ
• UN9215	8E	10kΩ	—
• UN9216	8F	4.7kΩ	—
• UN9217	8H	22kΩ	—
• UN9218	8I	0.51kΩ	5.1kΩ
• UN9219	8K	1kΩ	10kΩ
• UN9210	8L	47kΩ	—
• UN921D	8M	47kΩ	10kΩ
• UN921E	8N	47kΩ	22kΩ
• UN921F	8O	4.7kΩ	10kΩ
• UN921K	8P	10kΩ	4.7kΩ
• UN921L	8Q	4.7kΩ	4.7kΩ
• UNR921M	EL	2.2kΩ	47kΩ
• UNR921N	EX	4.7kΩ	47kΩ
• UNR921AJ	8X	100kΩ	100kΩ
• UNR921BJ	8Y	100kΩ	—
• UNR921CJ	8Z	—	47kΩ

Absolute Maximum Ratings (Ta=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



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	UN9211	I_{EBO}	$V_{EB} = 6V, I_C = 0$			0.5	mA	
	UN9212/9214/921E/921D					0.2		
	UN9213/UNR921M/921N/UNR921AJ					0.1		
	UN9215/9216/9217/9210/UNR921BJ					0.01		
	UN921F/921K					1.0		
	UN9219					1.5		
	UN9218/921L/UNR921CJ					2.0		
Collector to base voltage		V_{CBO}	$I_C = 10\mu A, I_E = 0$	50			V	
Collector to emitter voltage		V_{CEO}	$I_C = 2mA, I_B = 0$	50			V	
Forward current transfer ratio	UN9211	h_{FE}	$V_{CE} = 10V, I_C = 5mA$	35				
	UN9212/921E			60				
	UN9213/9214/921M/UNR921AJ/921CJ			80				
	UN9215*/9216*/9217*/9210*/UNR921BJ			160		460		
	UN921F/921D/9219			30				
	UN9218/921K/921L			20				
	UN921N			80		400		
Collector to emitter saturation voltage		$V_{CE(sat)}$	$I_C = 10mA, I_B = 0.3mA$			0.25	V	
Output voltage high level		V_{OH}	$V_{CC} = 5V, V_B = 0.5V, R_L = 1k\Omega$	4.9			V	
Output voltage low level		V_{OL}	$V_{CC} = 5V, V_B = 2.5V, R_L = 1k\Omega$			0.2	V	
			$V_{OC} = 5V, V_B = 3.5V, R_1 = 1k\Omega$			0.2		
			$V_{CC} = 5V, V_B = 10V, R_1 = 1k\Omega$			0.2		
			$V_{CC} = 5V, V_B = 6V, R_L = 1k\Omega$			0.2		
			$V_{CC} = 5V, V_B = 5V, R_L = 1k\Omega$			0.2		
Transition frequency		f_T	$V_{CB} = 10V, I_E = -2mA, f = 200MHz$		150		MHz	
Input resistance	UN9211/9214/9215/921K	R_1		(-30%)		(+30%)	k Ω	
	UN9212/9217							10
	UN9213/921D/921E/9210							22
	UN9216/921F/921L/UNR921N							47
	UN9218							4.7
	UN9219/UNR921M							0.51
	UNR921AJ/921BJ							1
	100							

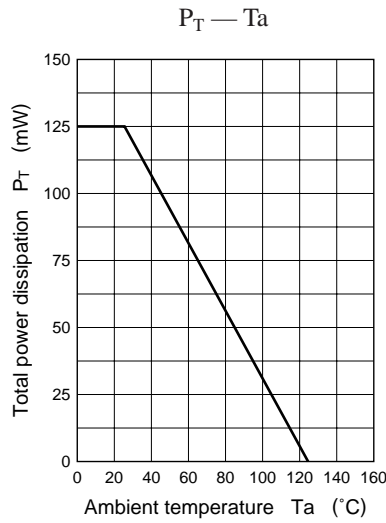
* h_{FE} rank classification (UN9215/9216/9217/9210)

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

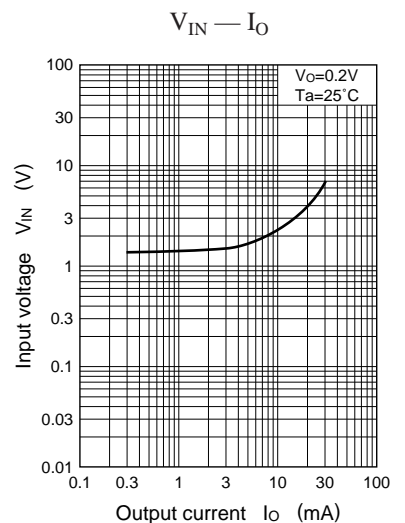
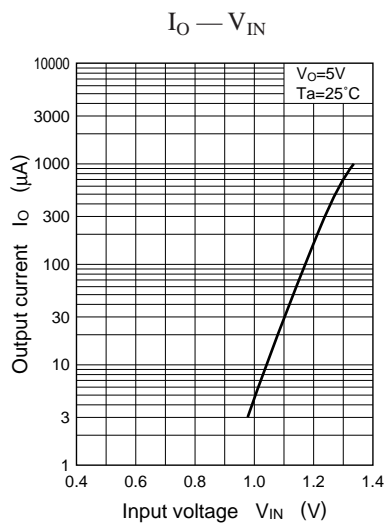
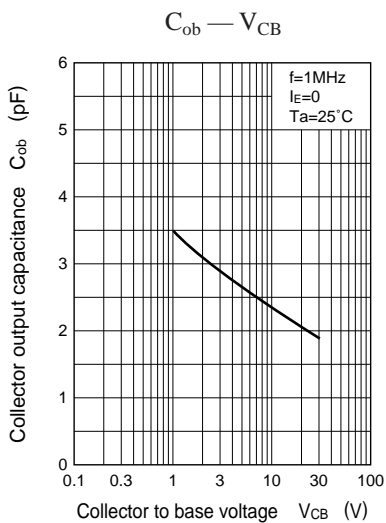
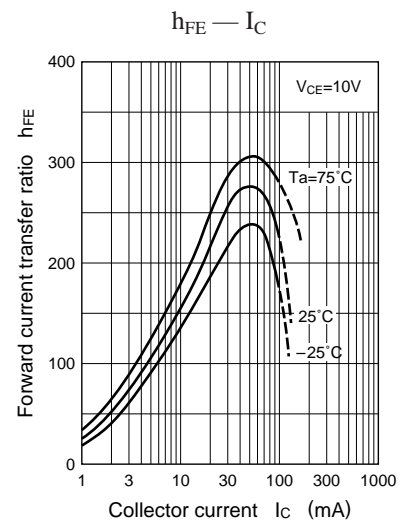
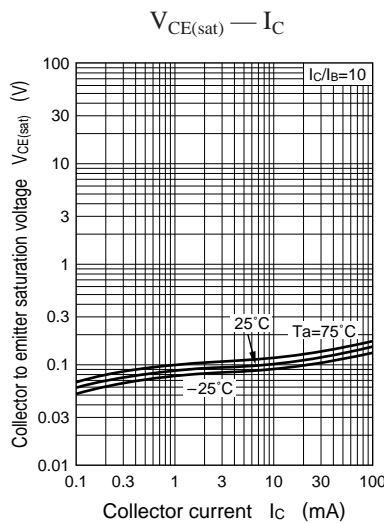
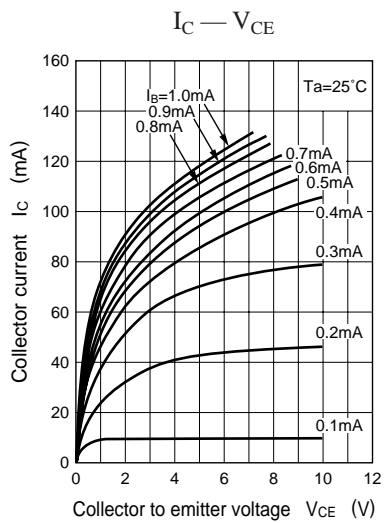
■ **Electrical Characteristics (continued)** (Ta=25°C)

Parameter		Symbol	Conditions	min	typ	max	Unit
Resis- tance ratio	UN9211/9212/9213/921L	R_1/R_2		0.8	1.0	1.2	
	UN9214			0.17	0.21	0.25	
	UN9218/9219			0.08	0.1	0.12	
	UN921D				4.7		
	UN921E				2.14		
	UN921F				0.47		
	UN921K				2.13		
	UN921M				0.047		
	UN921N				0.1		
	UNR921AJ				1.0		
Resistance between Emitter to Base	UNR921CJ	R_2		-30%	47	30%	kΩ

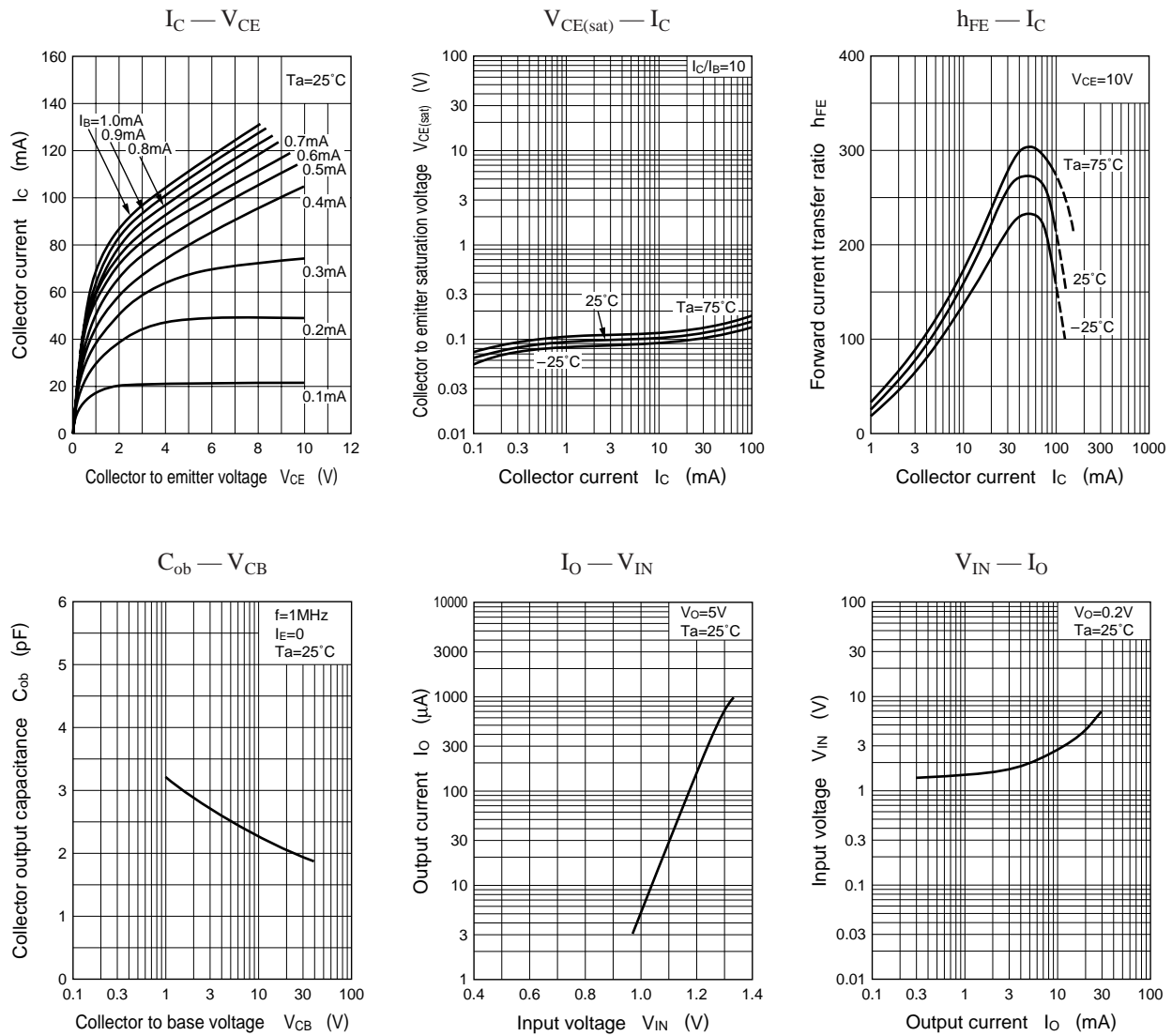
Common characteristics chart



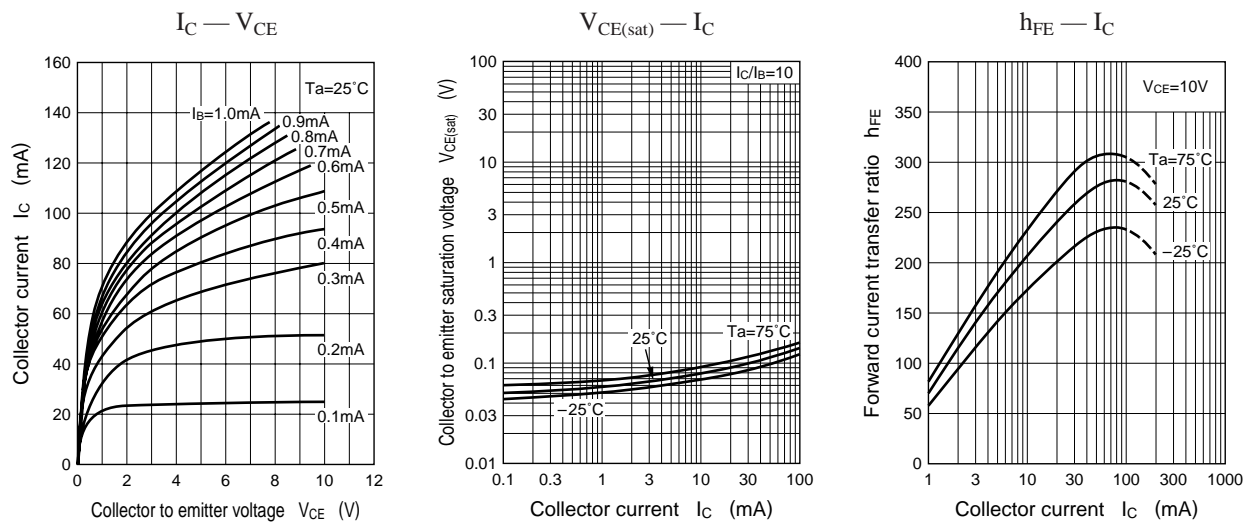
Characteristics charts of UN9211

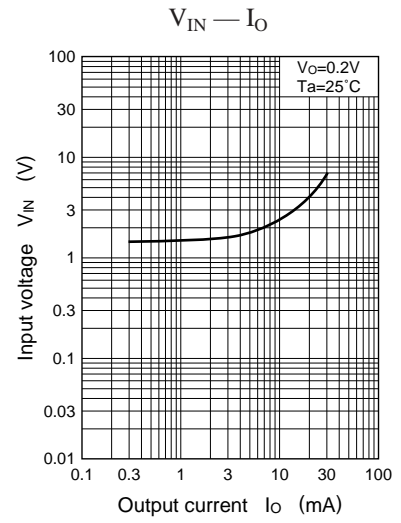
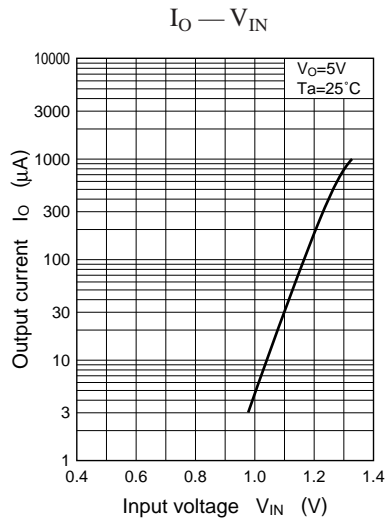
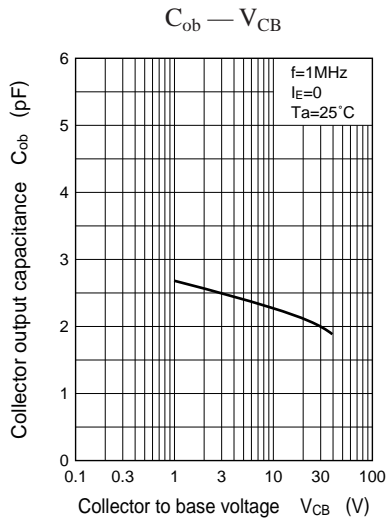


Characteristics charts of UN9212

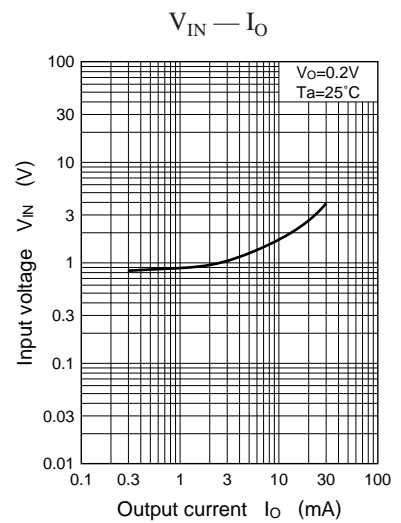
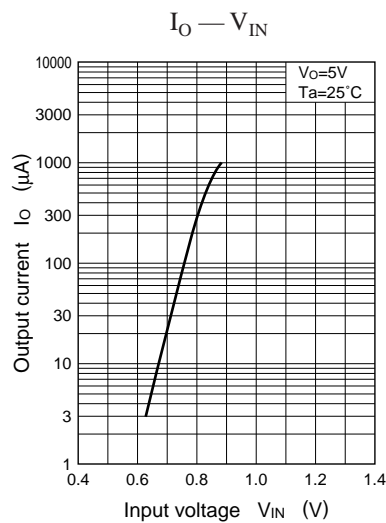
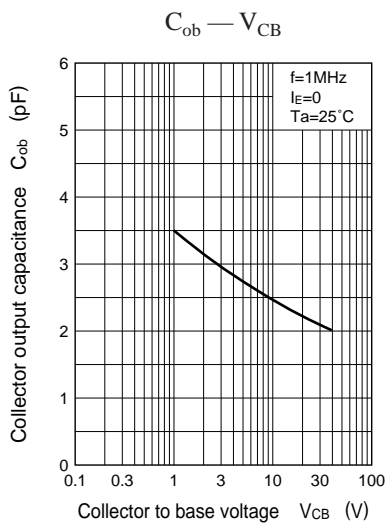
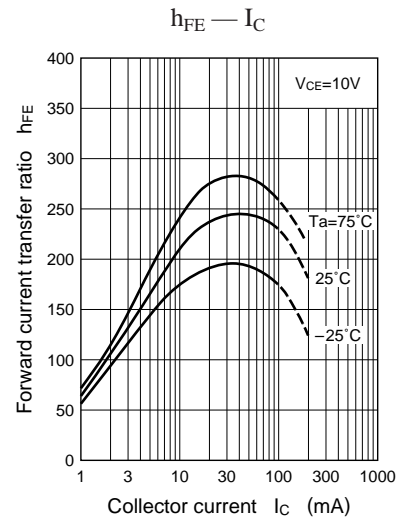
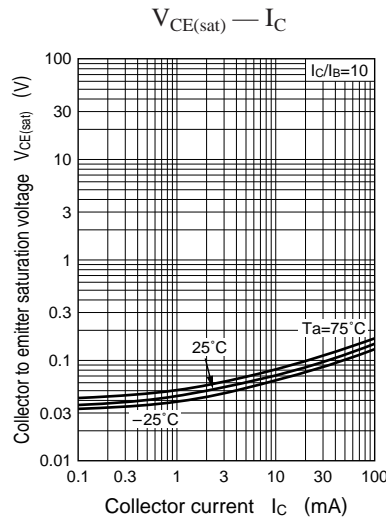
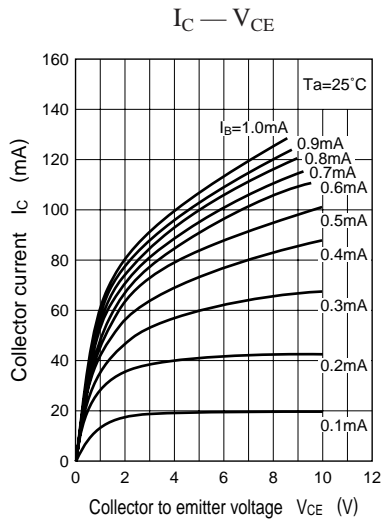


Characteristics charts of UN9213

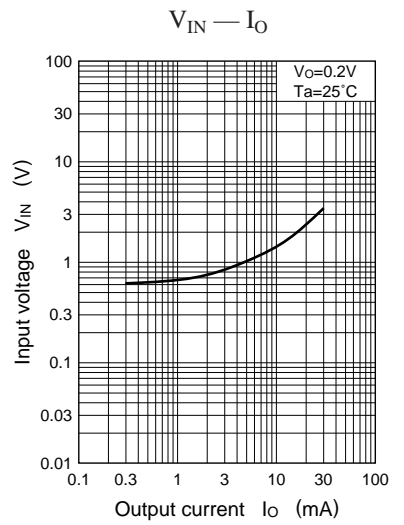
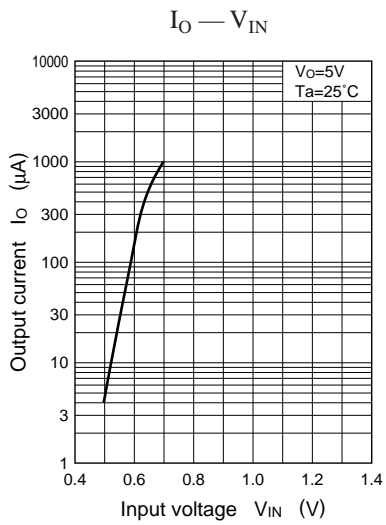
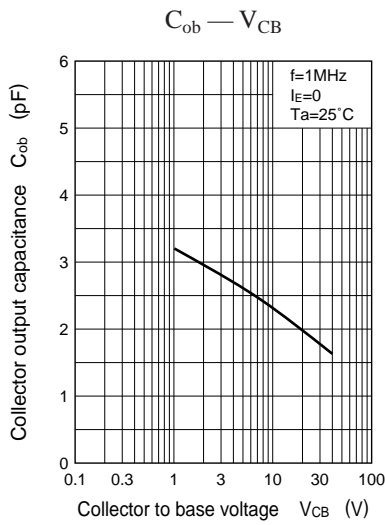
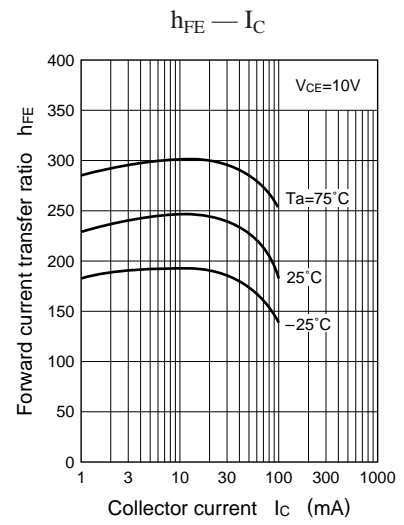
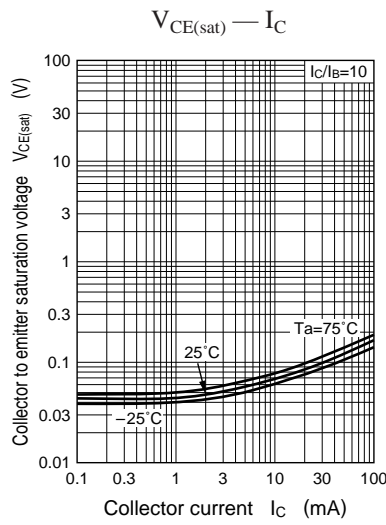
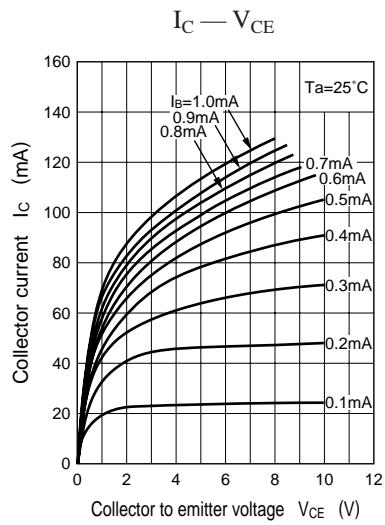




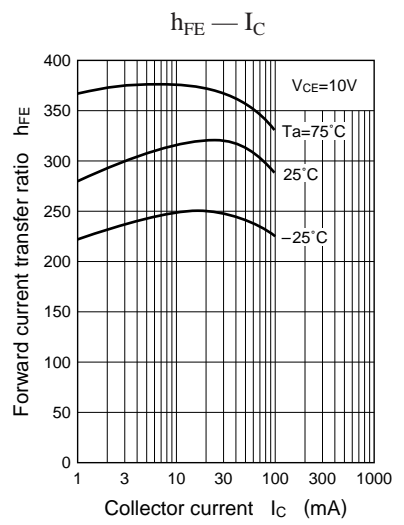
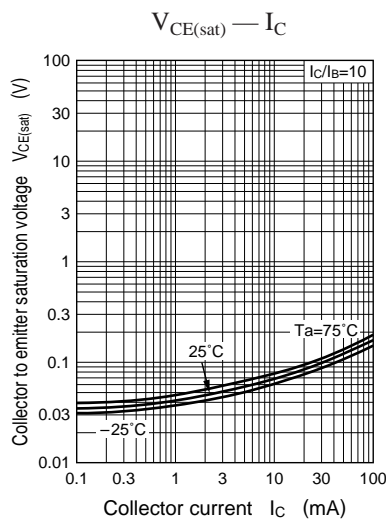
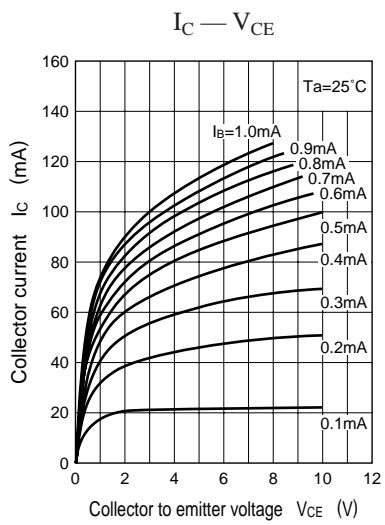
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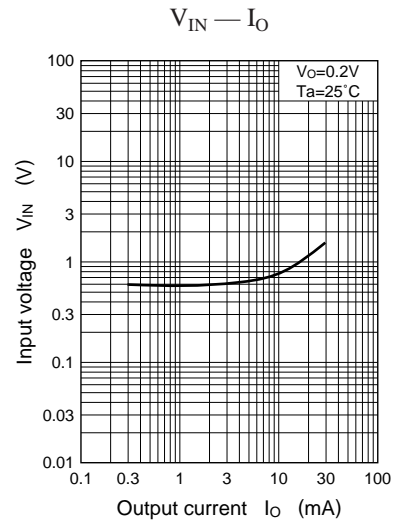
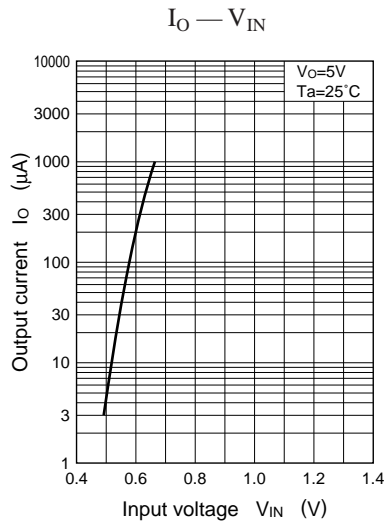
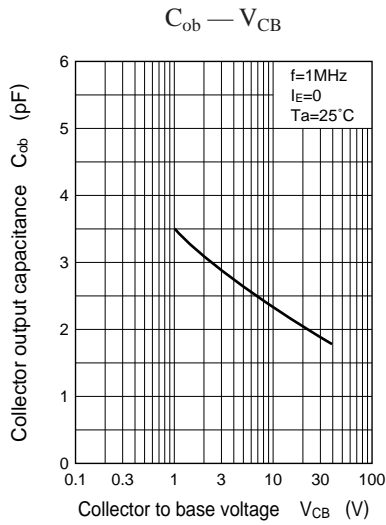


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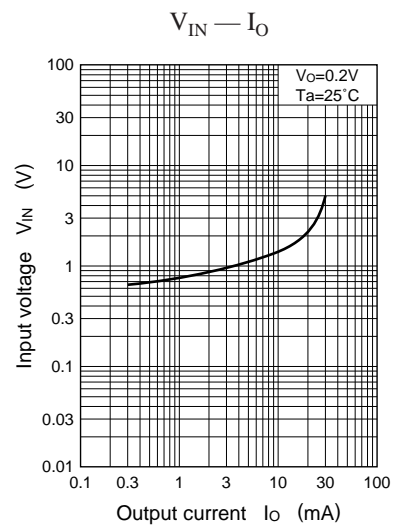
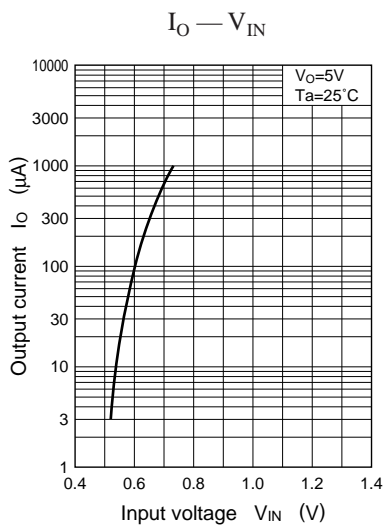
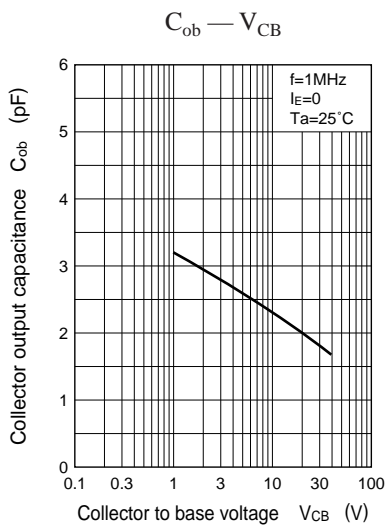
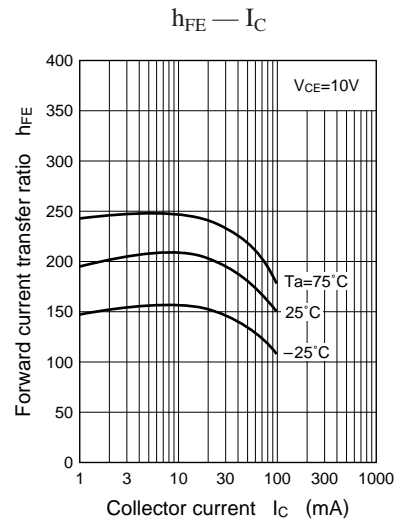
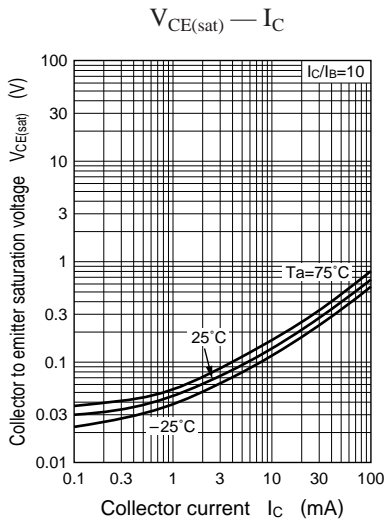
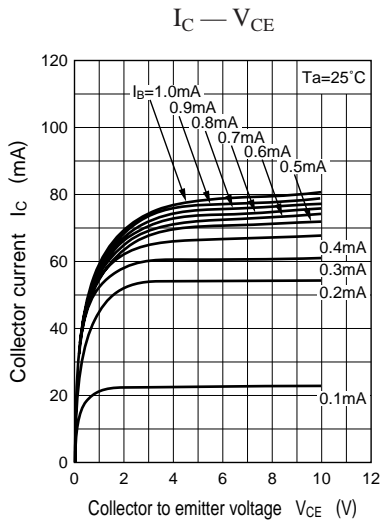


Characteristics charts of UN9216

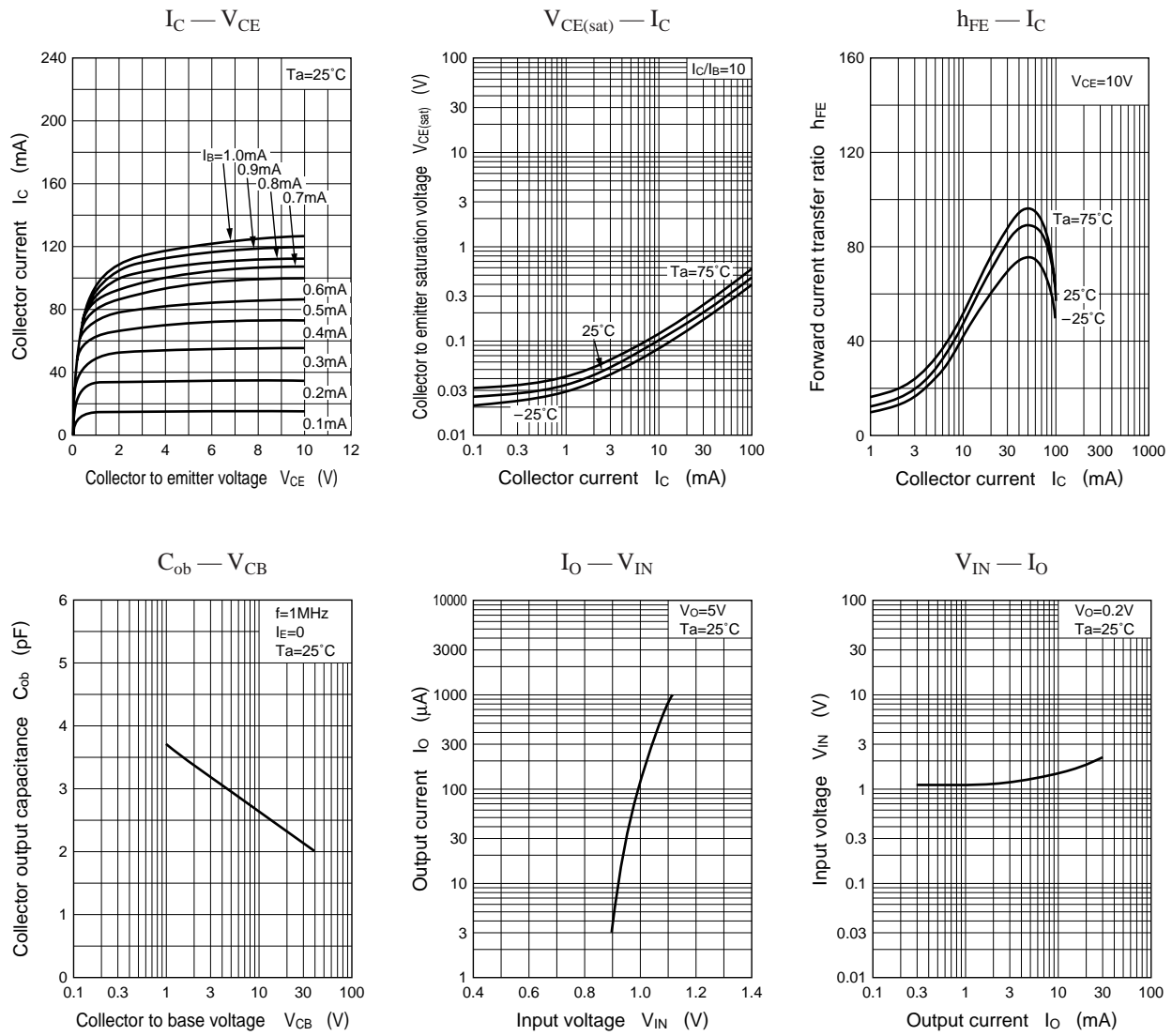




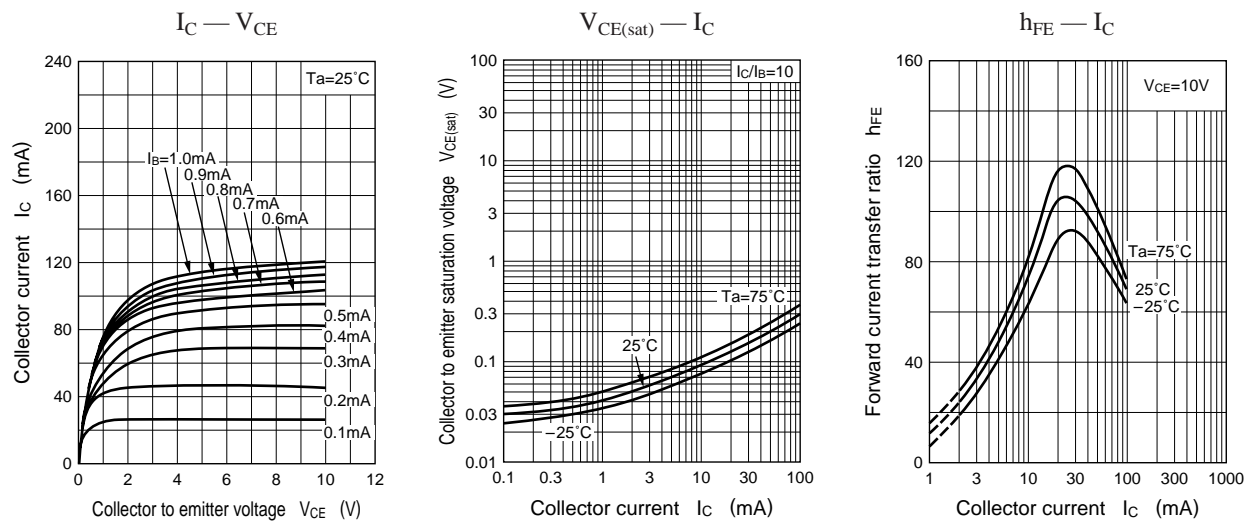
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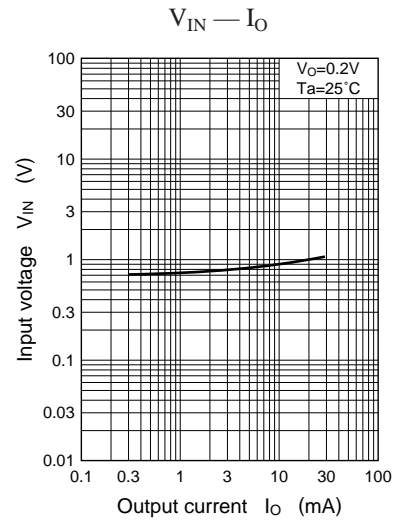
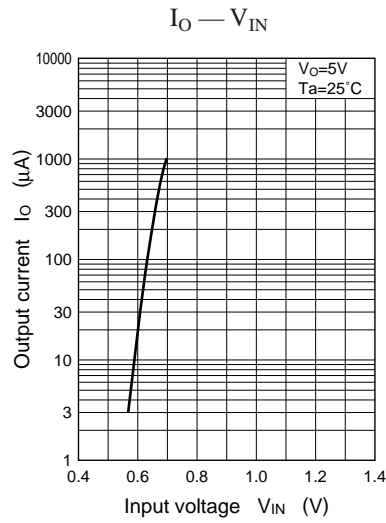
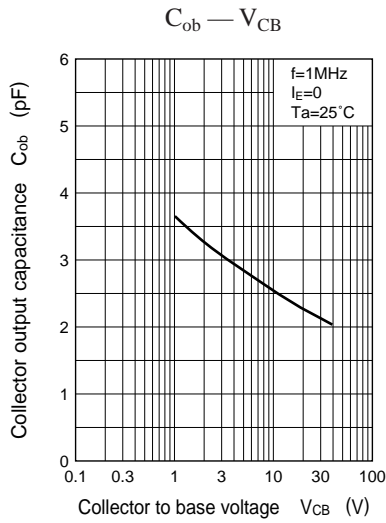


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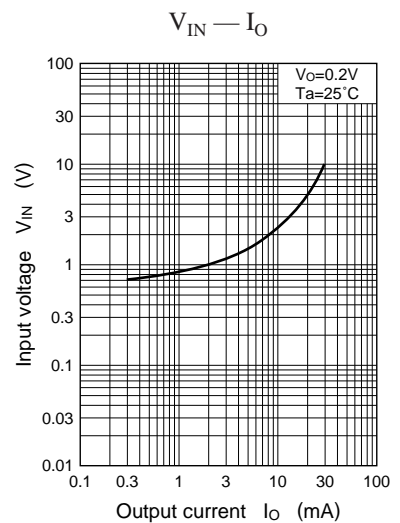
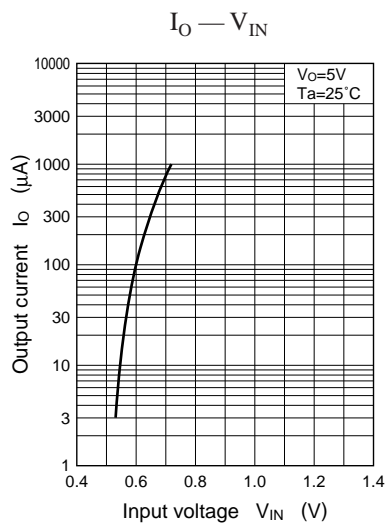
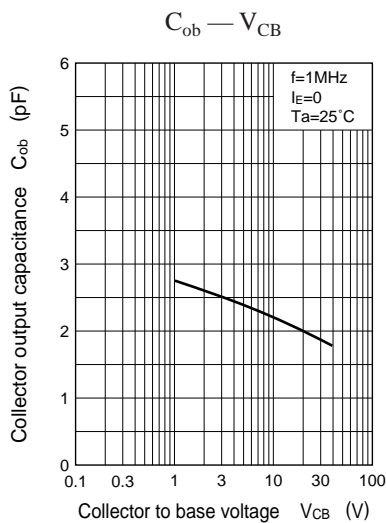
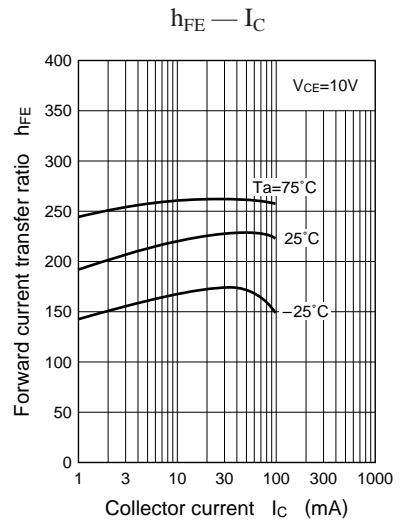
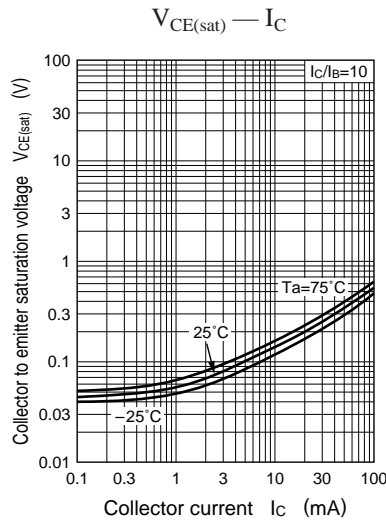
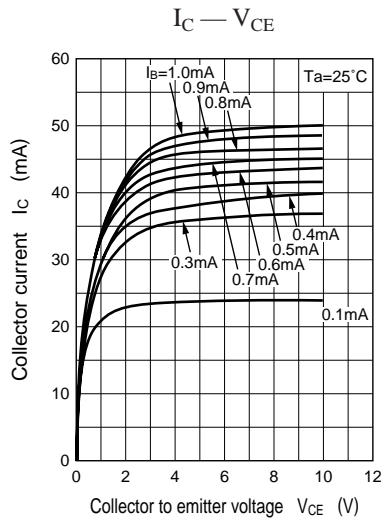


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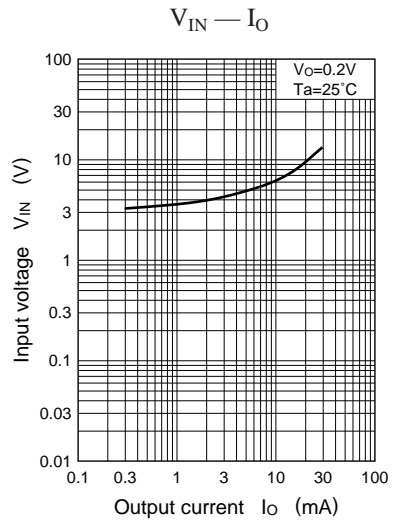
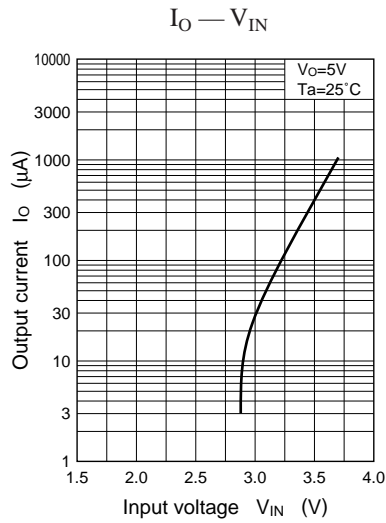
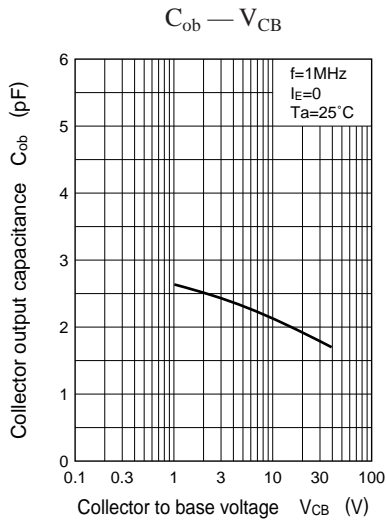
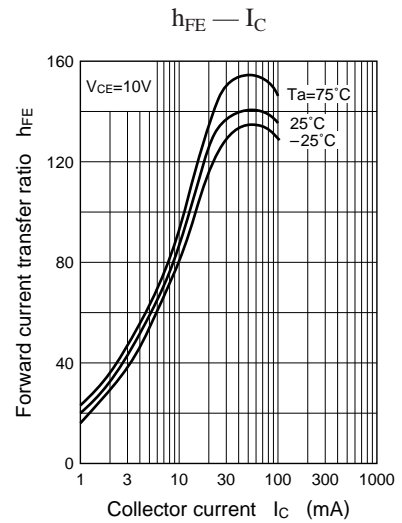
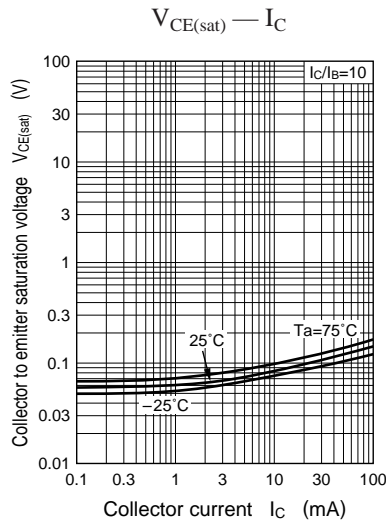
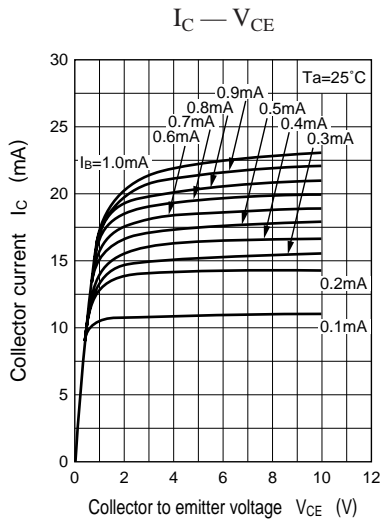




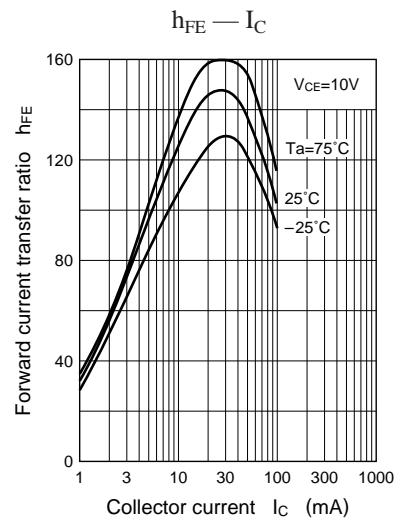
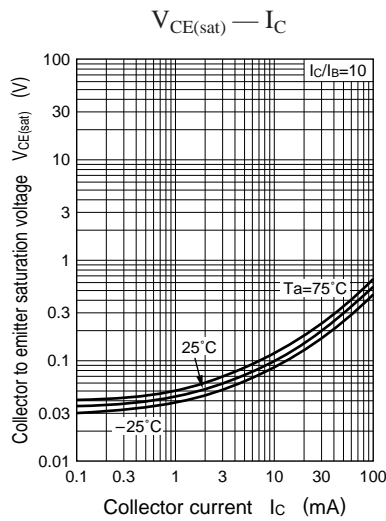
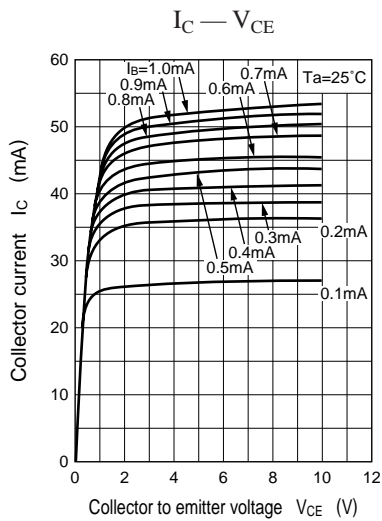
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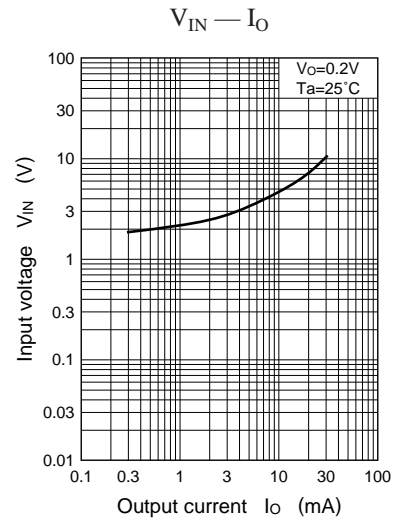
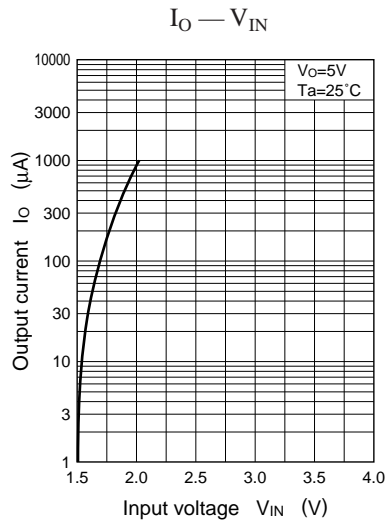
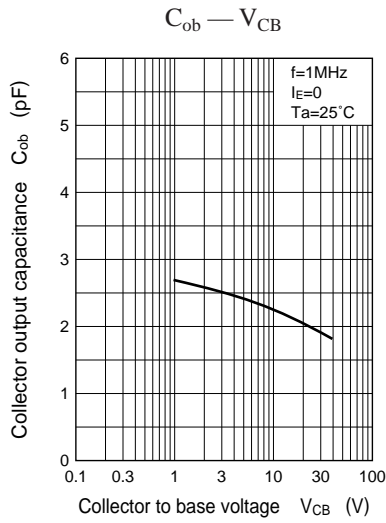


Characteristics charts of UN921D

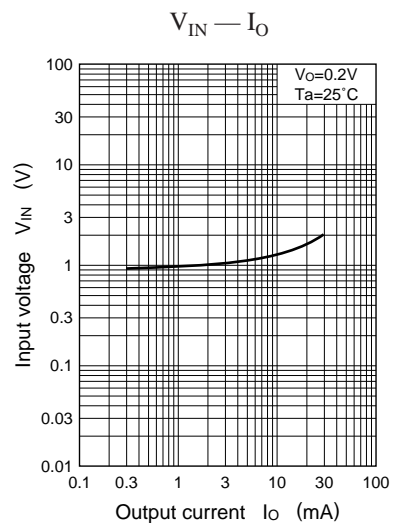
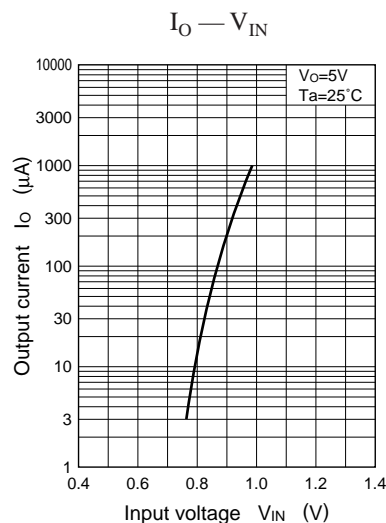
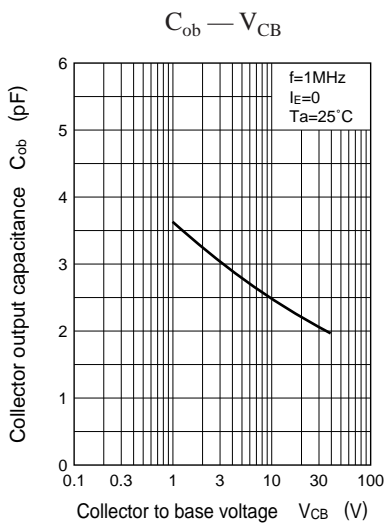
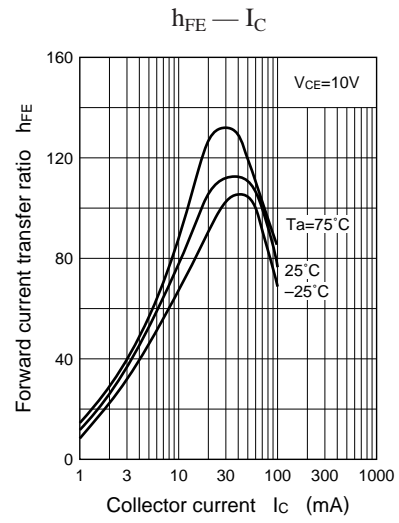
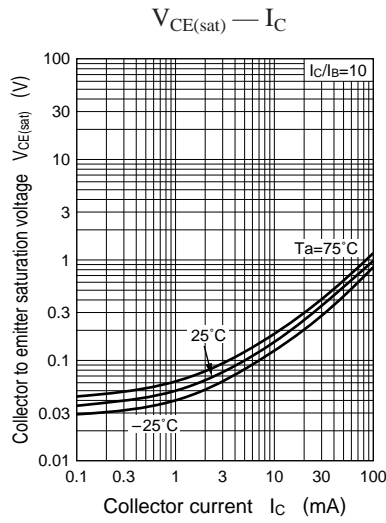
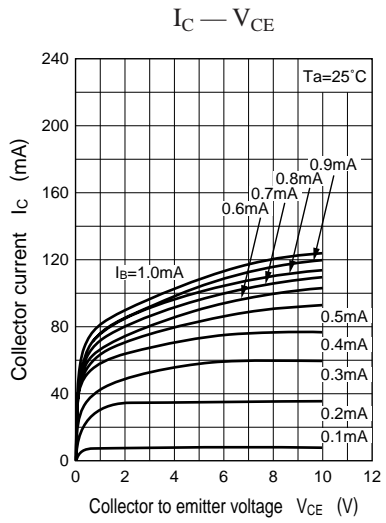


Characteristics charts of UN921E

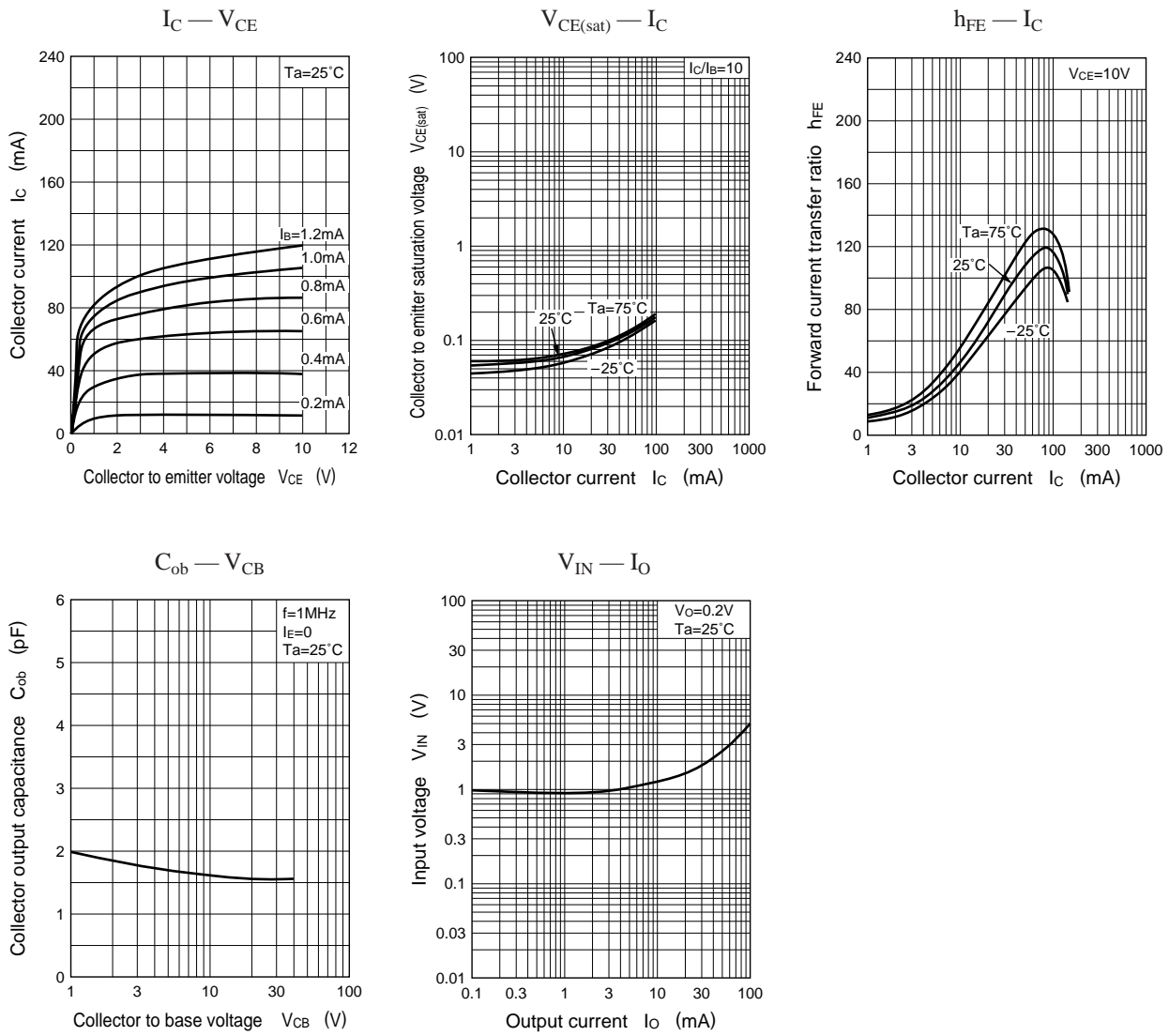




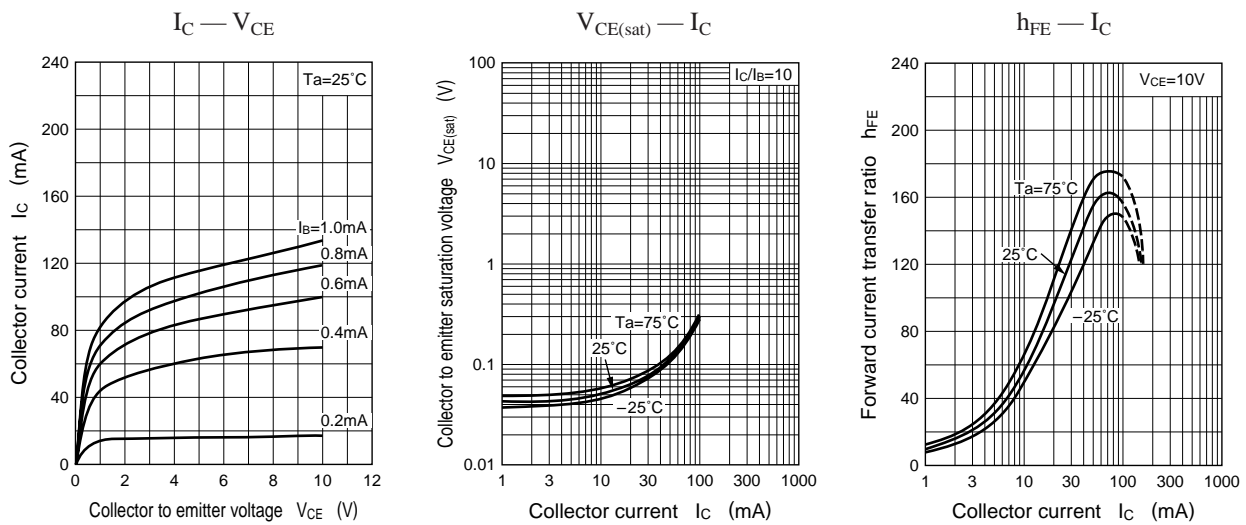
Characteristics charts of UN921F

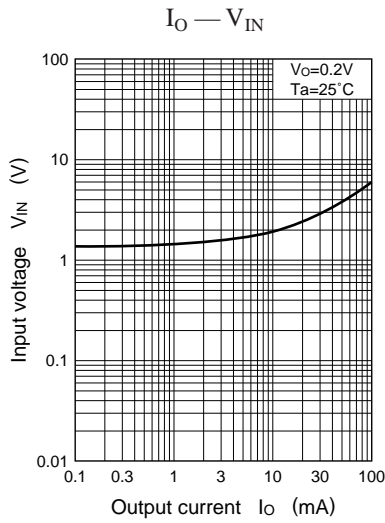
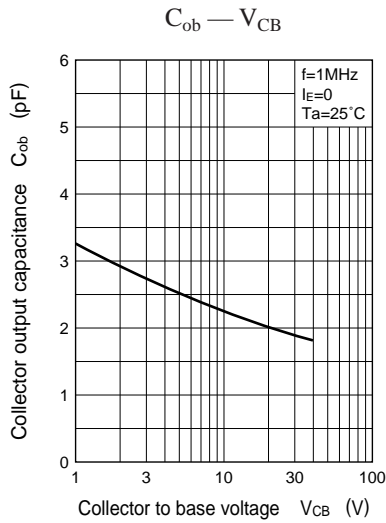


Characteristics charts of UN921K

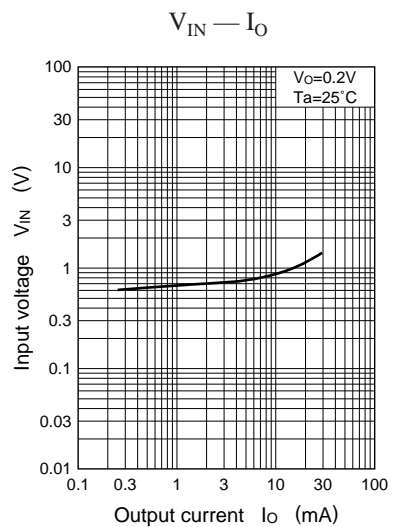
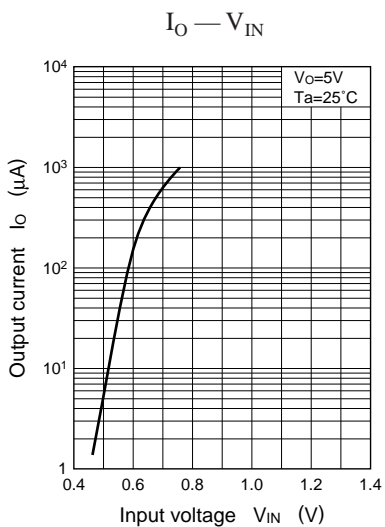
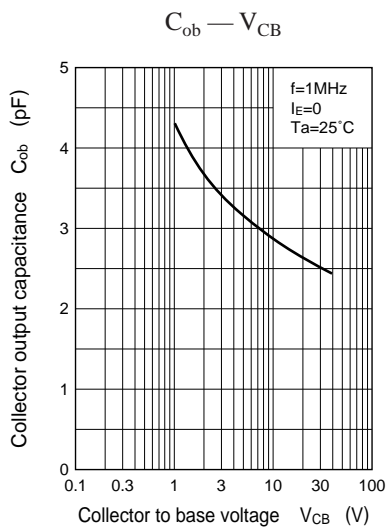
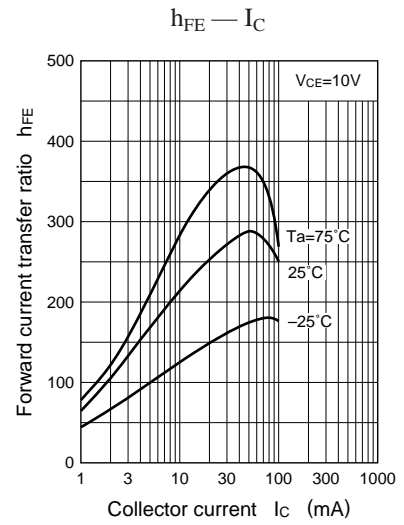
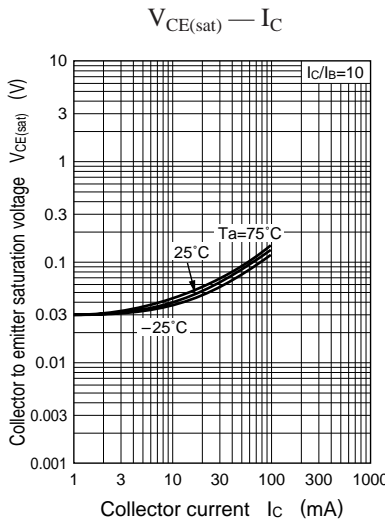
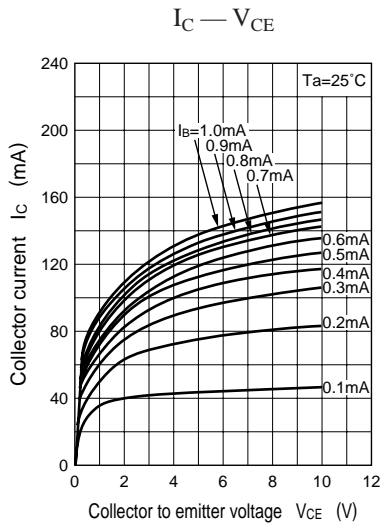


Characteristics charts of UN921L





Characteristics charts of UN921M



Characteristics charts of UN921N

