

UNR4221/4222/4223/4224

(UN4221/4222/4223/4224)

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
- New S type package, allowing supply with the radial taping

■ Resistance by Part Number

	(R ₁)	(R ₂)
• UNR4221 (UN4221)	2.2 kΩ	2.2 kΩ
• UNR4222 (UN4222)	4.7 kΩ	4.7 kΩ
• UNR4223 (UN4223)	10 kΩ	10 kΩ
• UNR4224 (UN4224)	2.2 kΩ	10 kΩ

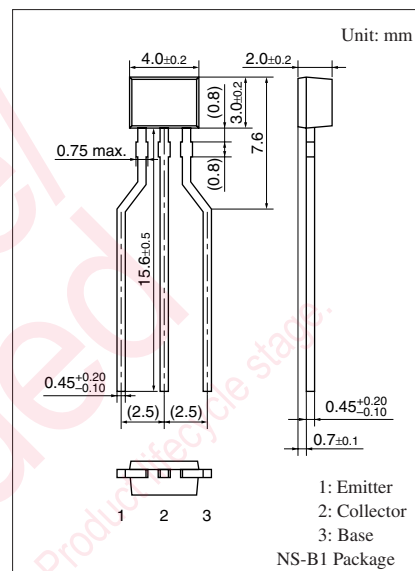
■ Absolute Maximum Ratings T_a = 25°C

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	V _{CBO}	50	V
Collector-emitter voltage (Base open)	V _{CEO}	50	V
Collector current	I _C	500	mA
Total power dissipation	P _T	300	mW
Junction temperature	T _j	150	°C
Storage temperature	T _{stg}	-55 to +150	°C

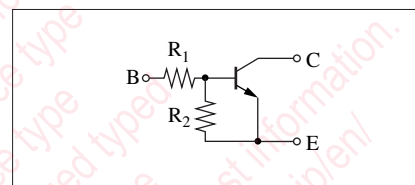
■ Electrical Characteristics T_a = 25°C ± 3°C

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			1.0	μA
Collector-emitter cutoff current (Base open)		I _{CEO}	V _{CE} = 50 V, I _B = 0			1.0	μA
Emitter-base cutoff current (Collector open)	UNR4221	I _{EBO}	V _{EB} = 6 V, I _C = 0			5.0	mA
	UNR4222					2.0	
	UNR4223/4224					1.0	
Forward current transfer ratio	UNR4221	h _{FE}	V _{CE} = 10 V, I _C = 100 mA	40			—
	UNR4222			50			
	UNR4223/4224			60			
Collector-emitter saturation voltage		V _{CE(sat)}	I _C = 100 mA, I _B = 5 mA			0.25	V
Output voltage high-level		V _{OH}	V _{CC} = 5 V, V _B = 0.5 V, R _L = 500 Ω	4.9			V
Output voltage low-level		V _{OL}	V _{CC} = 5 V, V _B = 3.5 V, R _L = 500 Ω			0.2	V

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



Internal Connection

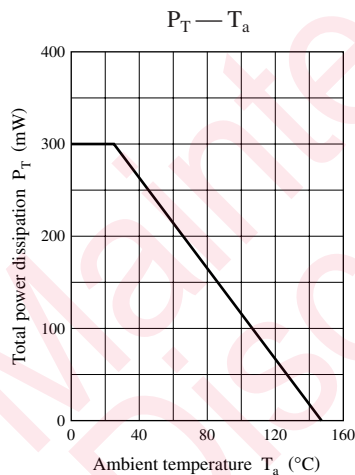


■ Electrical Characteristics (continued) $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

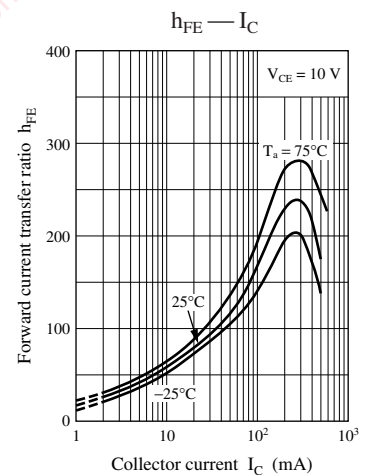
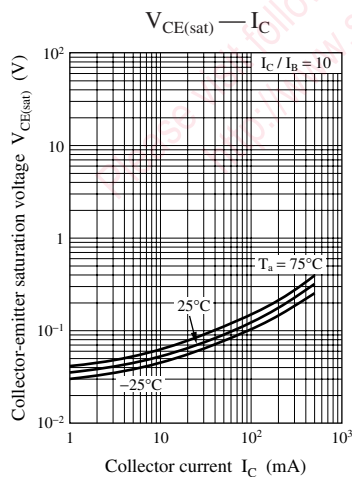
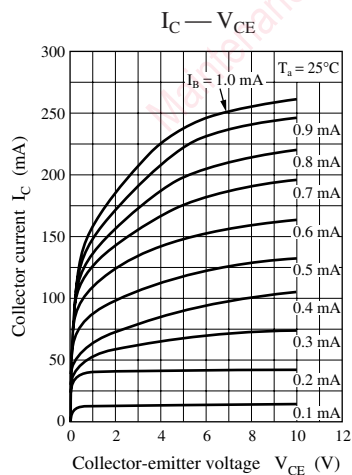
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Transition frequency		f_T	$V_{CB} = 10\text{ V}$, $I_E = -50\text{ mA}$, $f = 200\text{ MHz}$		200		MHz
Input resistance	UNR4221/4224	R_1		-30%	2.2	+30%	$\text{k}\Omega$
	UNR4222				4.7		
	UNR4223				10		
Resistance ratio		R_1/R_2		0.8	1.0	1.2	
	UNR4224			0.17	0.22	0.27	

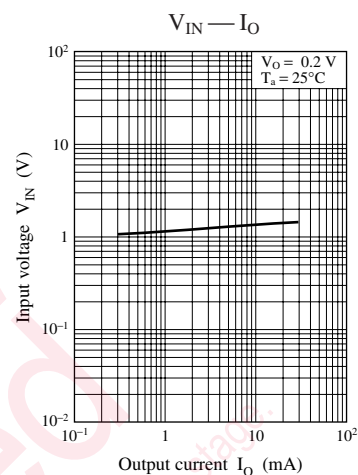
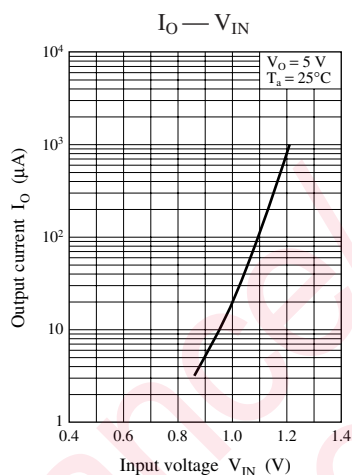
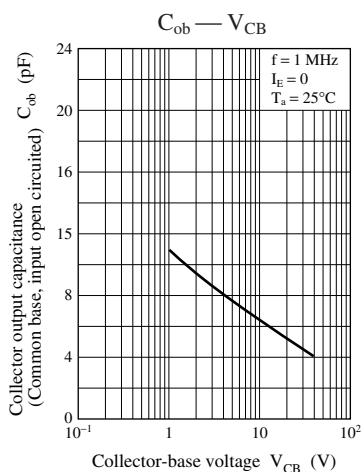
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

Common characteristics chart

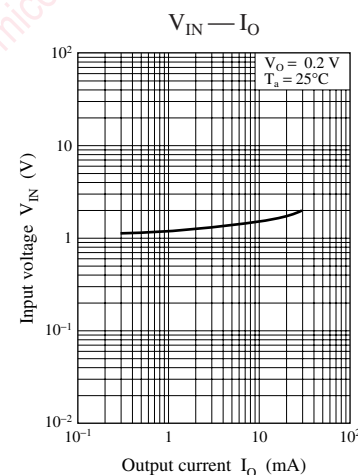
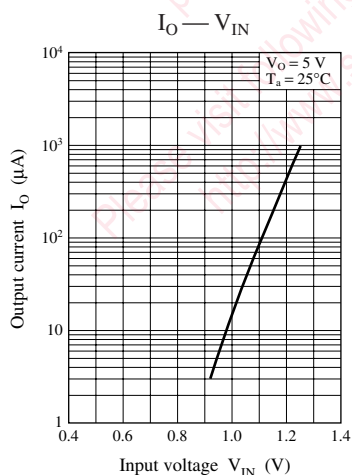
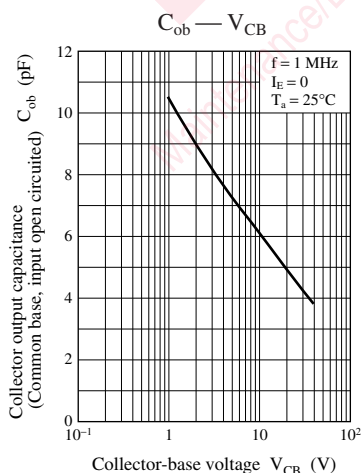
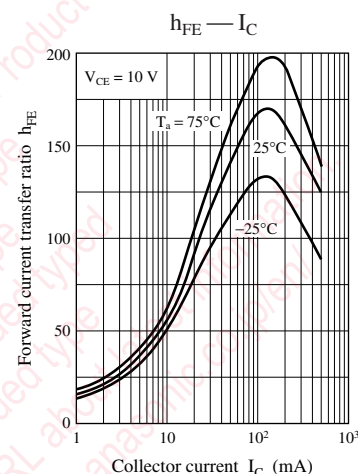
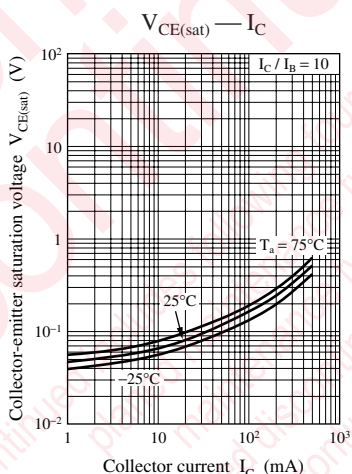
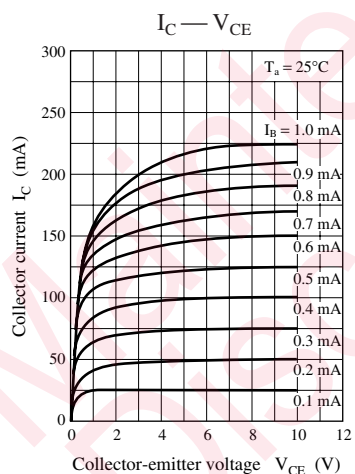


Characteristics charts of UNR4221

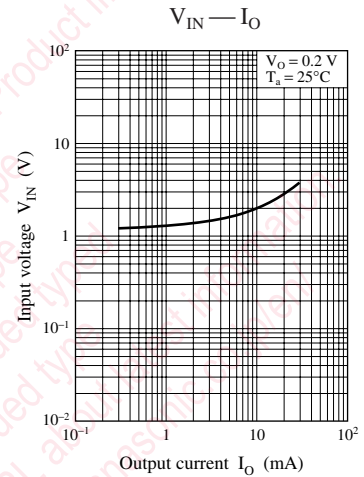
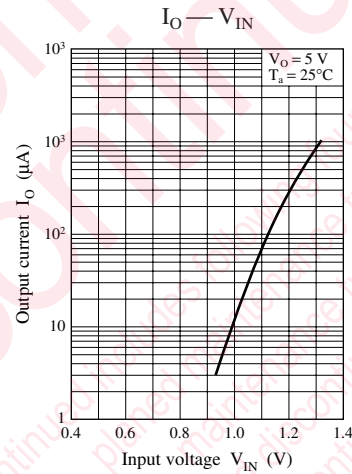
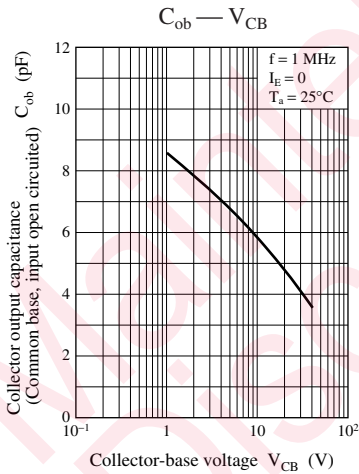
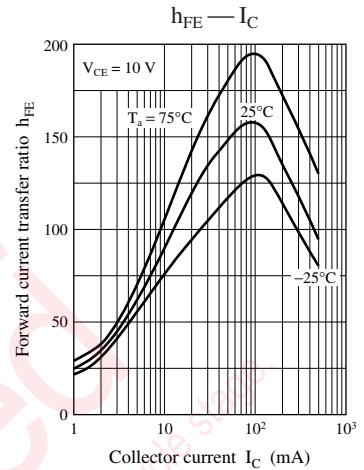
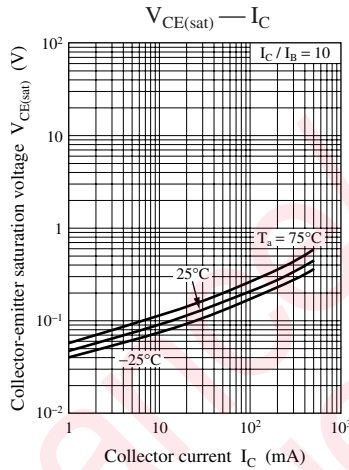
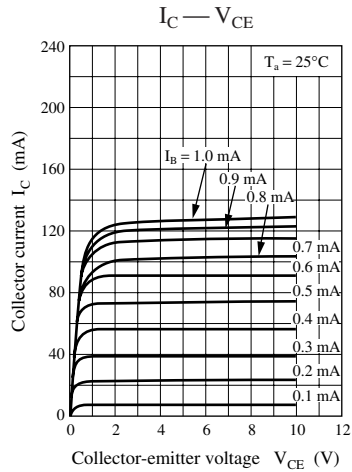




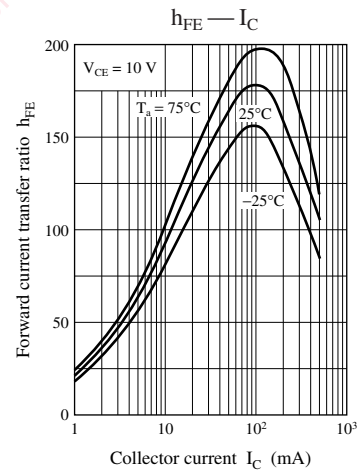
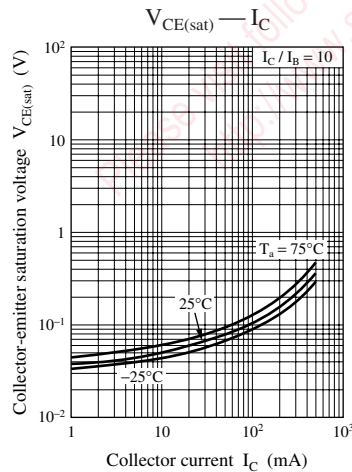
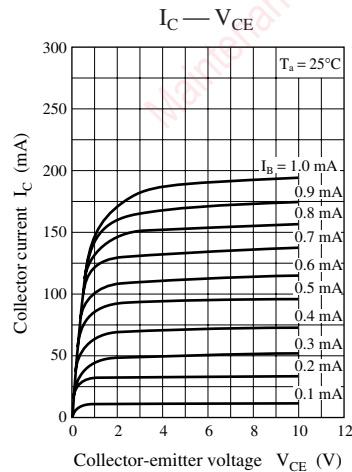
Characteristics charts of UNR4222

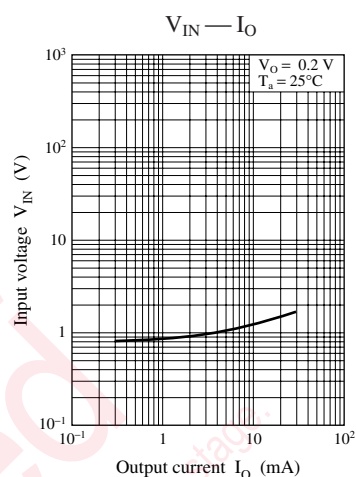
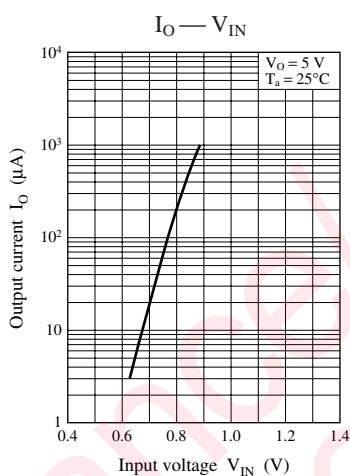
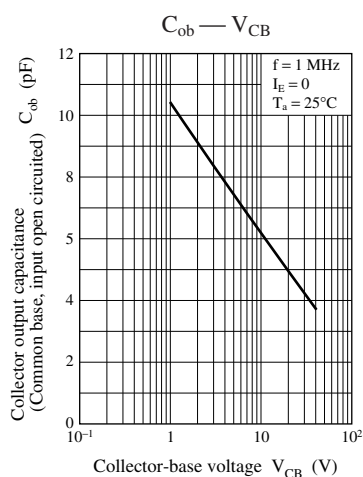


Characteristics charts of UNR4223



Characteristics charts of UNR4224





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