

UNR2221/2222/2223/2224 (UN2221/2222/2223/2224)

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.
- Mini type package, allowing downsizing of the equipment and automatic insertion through tape packing and magazine packing.

■ Resistance by Part Number

	Marking Symbol	(R ₁)	(R ₂)
• UNR2221	9A	2.2kΩ	2.2kΩ
• UNR2222	9B	4.7kΩ	4.7kΩ
• UNR2223	9C	10kΩ	10kΩ
• UNR2224	9D	2.2kΩ	10kΩ

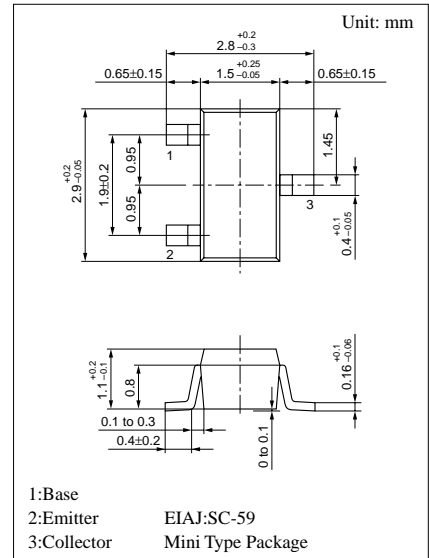
■ Absolute Maximum Ratings (T_a=25°C)

Parameter	Symbol	Ratings	Unit
Collector to base voltage	V _{CBO}	50	V
Collector to emitter voltage	V _{CEO}	50	V
Collector current	I _C	500	mA
Total power dissipation	P _T	200	mW
Junction temperature	T _j	150	°C
Storage temperature	T _{stg}	-55 to +150	°C

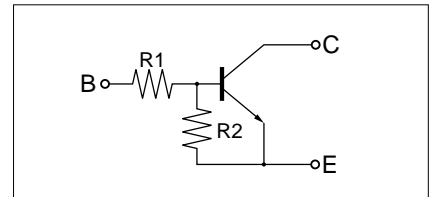
■ Electrical Characteristics (T_a=25°C)

Parameter		Symbol	Conditions	min	typ	max	Unit
Collector cutoff current		I _{CBO}	V _{CB} = 50V, I _E = 0			1	μA
		I _{CEO}	V _{CE} = 50V, I _B = 0			1	μA
Emitter cutoff current	UNR2221	I _{EBO}	V _{EB} = 6V, I _C = 0			5	mA
	UNR2222					2	
	UNR2223/2224					1	
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	UNR2221	h _{FE}	V _{CE} = 10V, I _C = 100mA	40			
	UNR2222			50			
	UNR2223/2224			60			
Collector to emitter saturation voltage		V _{CE(sat)}	I _C = 100mA, I _B = 5mA			0.25	V
Output voltage high level		V _{OH}	V _{CC} = 5V, V _B = 0.5V, R _L = 500Ω	4.9			V
Output voltage low level		V _{OL}	V _{CC} = 5V, V _B = 3.5V, R _L = 500Ω			0.2	V
Transition frequency		f _T	V _{CB} = 10V, I _E = -50mA, f = 200MHz		200		MHz
Input resistance	UNR2221/2224	R ₁			2.2		kΩ
	UNR2222			(-30%)	4.7	(+30%)	
	UNR2223				10		
Resistance ratio		R ₁ /R ₂		0.8	1.0	1.2	
				UNR2224		0.22	

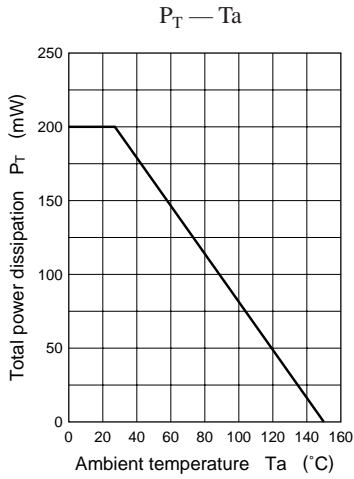
Note) The part numbers in the parenthesis show conventional part number.



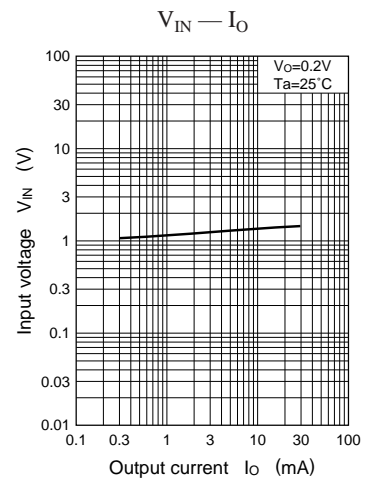
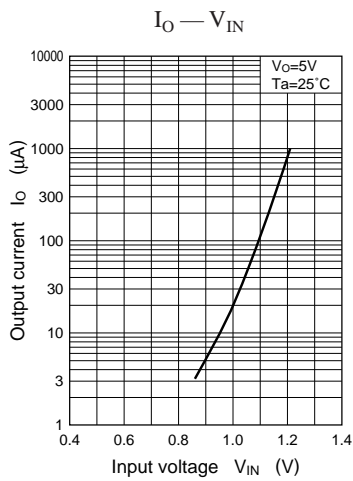
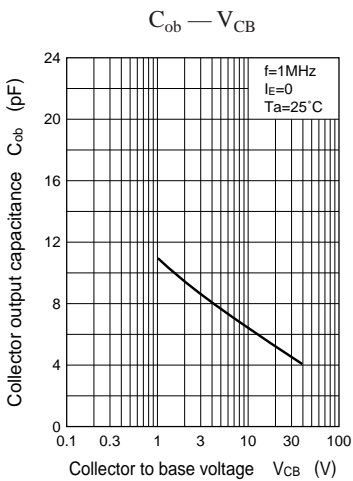
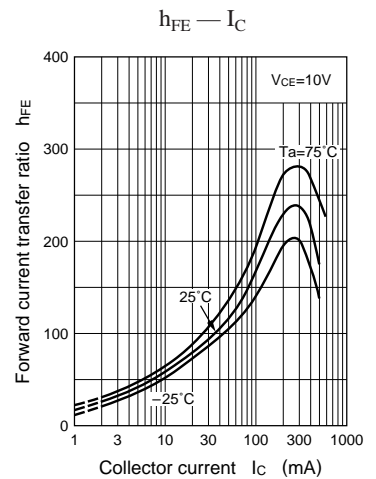
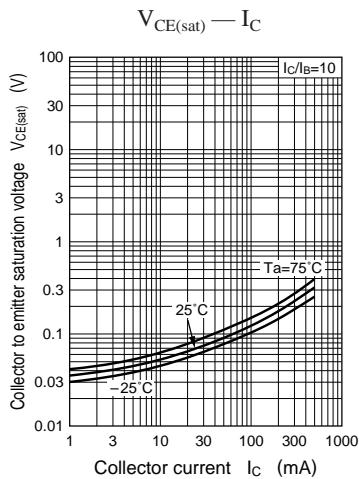
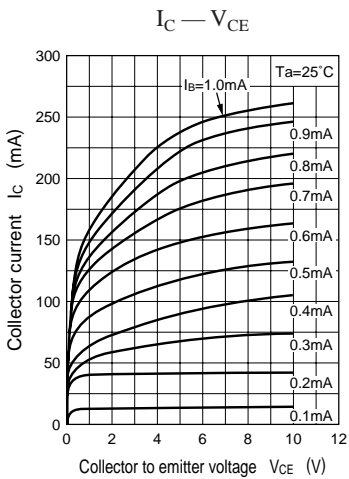
Internal Connection



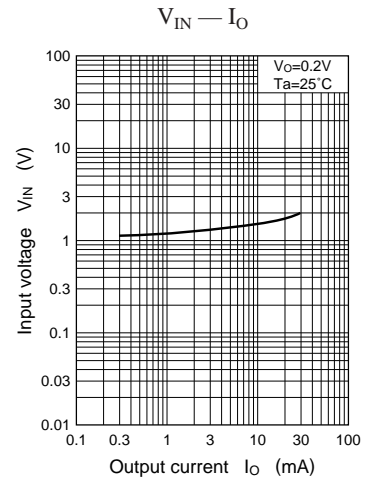
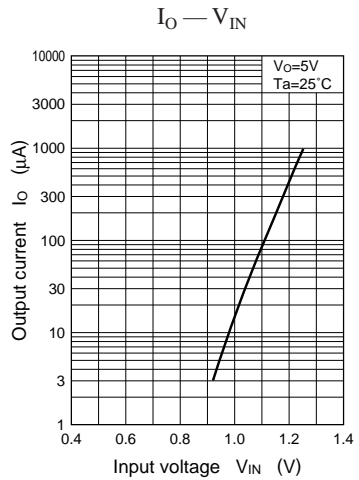
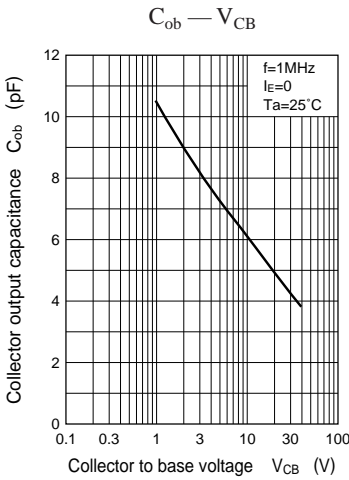
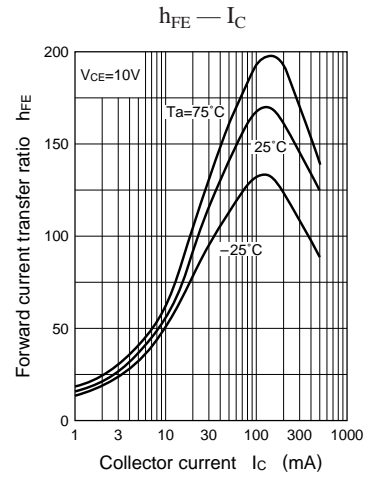
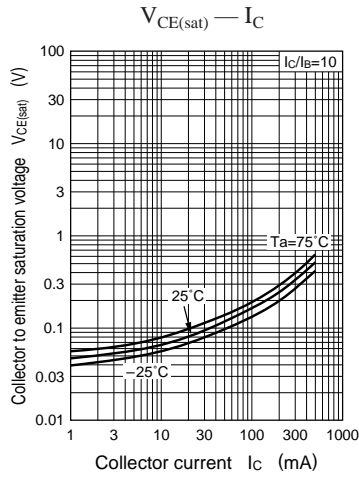
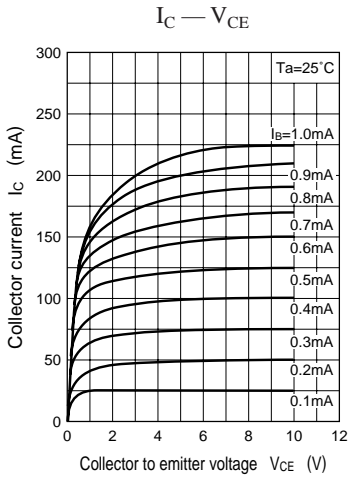
Common characteristics chart



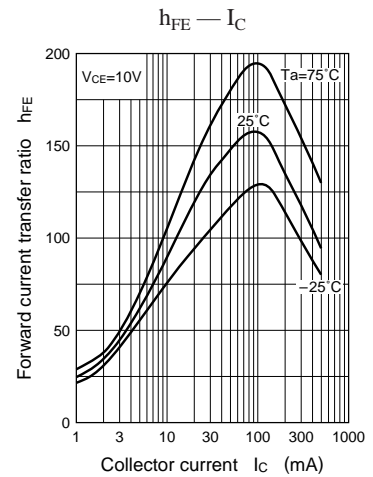
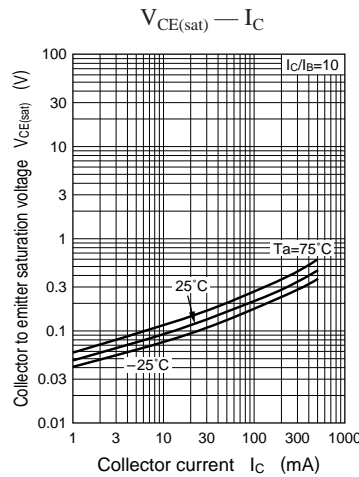
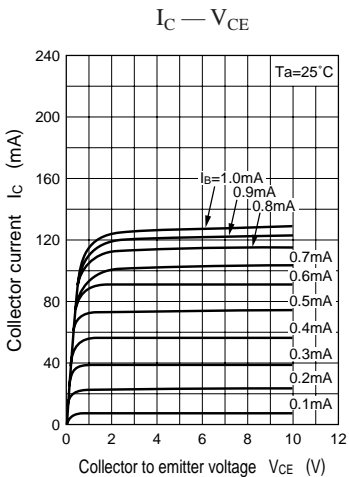
Characteristics charts of UNR2221

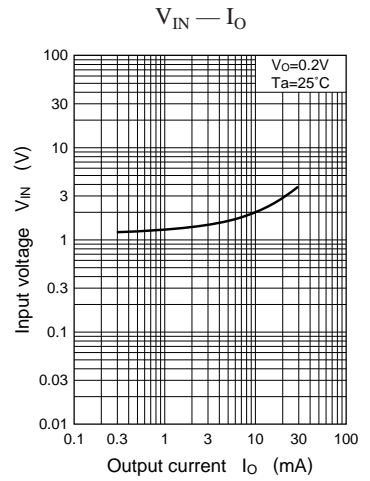
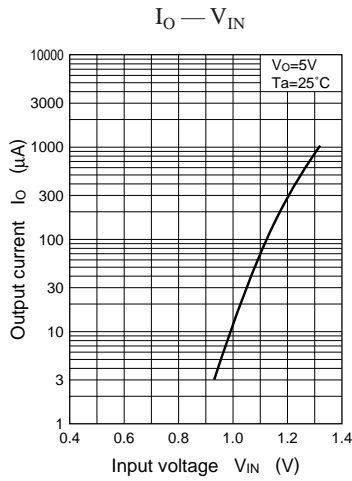
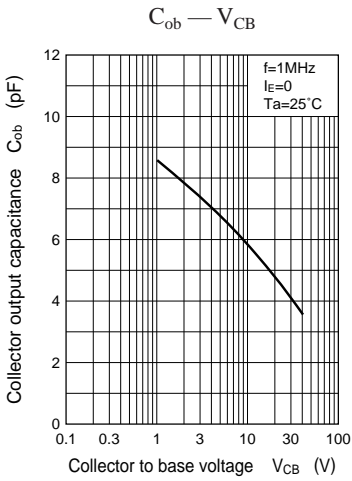


Characteristics charts of UNR2222

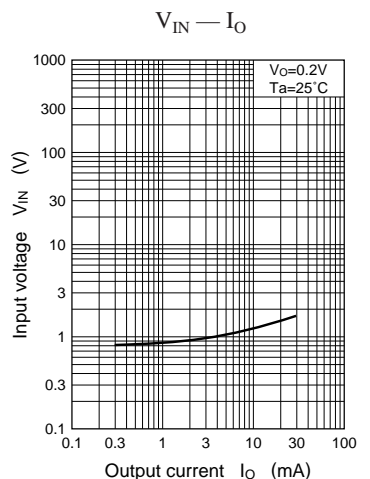
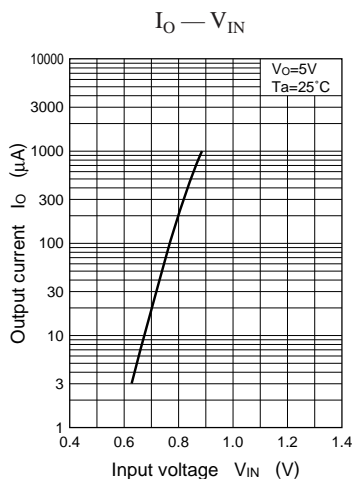
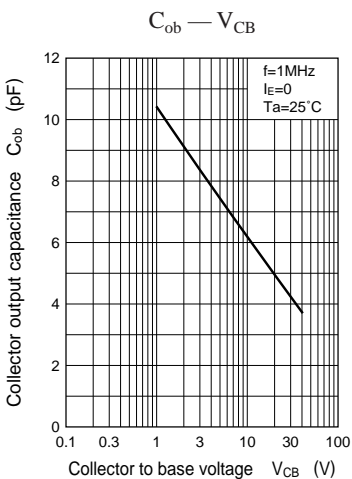
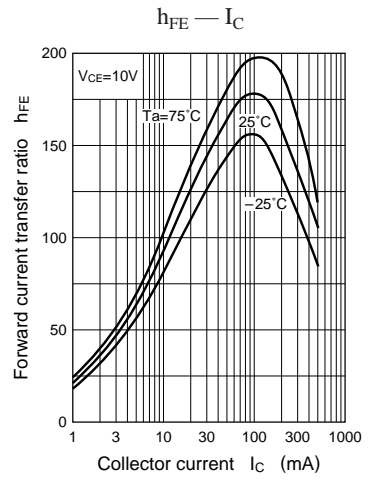
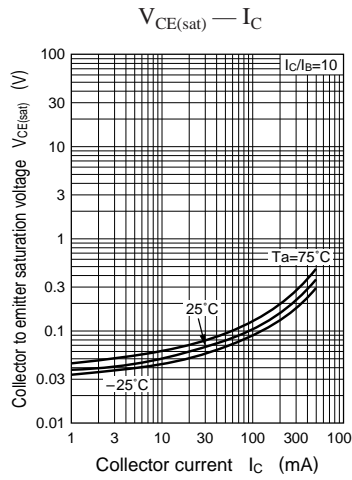
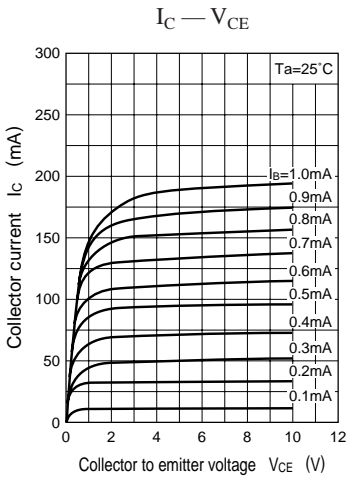


Characteristics charts of UNR2223





Characteristics charts of UNR2224



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