

UP04210/4211/4213/4214/4215/4216

Silicon NPN epitaxial planar transistor

For switching/digital circuits

■ Features

- Two elements incorporated into one package
(Transistors with built-in resistor)
- Reduction of the mounting area and assembly cost by one half

■ Resistance by Part Number

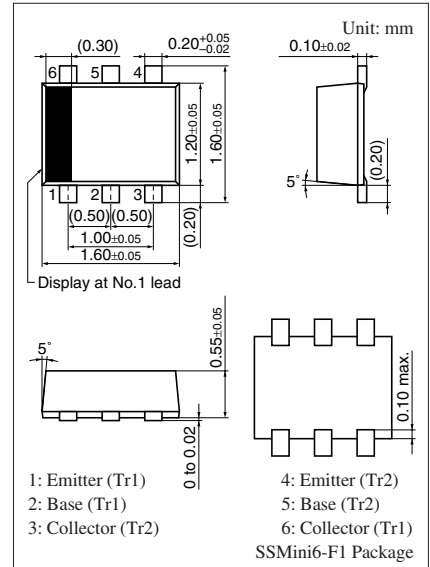
	Marking symbol	(R ₁)	(R ₂)
• UP04210	8Z	47 kΩ	—
• UP04211	9V	10 kΩ	10 kΩ
• UP04213	8S	47 kΩ	47 kΩ
• UP04214	BR	10 kΩ	47 kΩ
• UP04215	8T	10 kΩ	—
• UP04216	8U	4.7 kΩ	—

■ Absolute Maximum Ratings T_a = 25°C

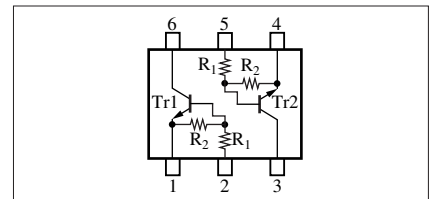
Parameter	Symbol	Rating	Unit
Collector to base voltage	V _{CBO}	50	V
Collector to emitter voltage	V _{CEO}	50	V
Collector current	I _C	100	mA
Total power dissipation	P _T	125	mW
Junction temperature	T _j	125	°C
Storage temperature	T _{stg}	-55 to +125	°C

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

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Collector to base voltage		V _{CBO}	I _C = 10 μA, I _E = 0	50			V
Collector to emitter voltage		V _{CEO}	I _C = 2 mA, I _B = 0	50			V
Collector cutoff current		I _{CBO}	V _{CB} = 50 V, I _E = 0			0.1	μA
		I _{CEO}	V _{CE} = 50 V, I _B = 0			0.5	
Emitter cutoff current	UP04211	I _{EBO}	V _{EB} = 6 V, I _C = 0			0.5	mA
	UP04214					0.2	
	UP04213					0.1	
	UP04210/4215/4216					0.01	
Forward current transfer ratio	UP04211	h _{FE}	V _{CE} = 10 V, I _C = 5 mA	35			
	UP04213/4214			80			
	UP04210/4215/4216			160	460		
Collector to emitter saturation voltage		V _{CE(sat)}	I _C = 10 mA, I _B = 0.3 mA			0.25	V



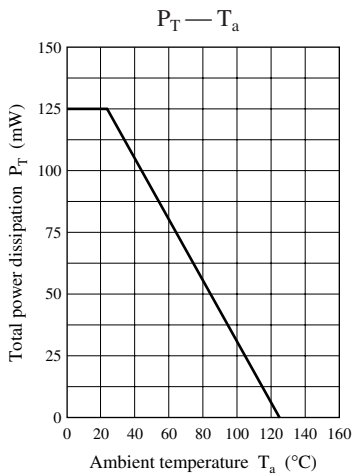
Internal Connection



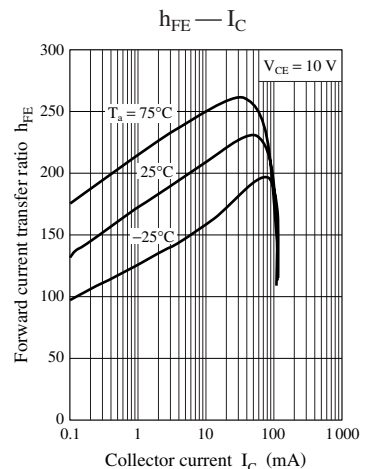
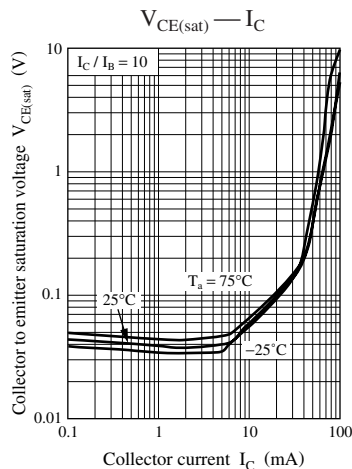
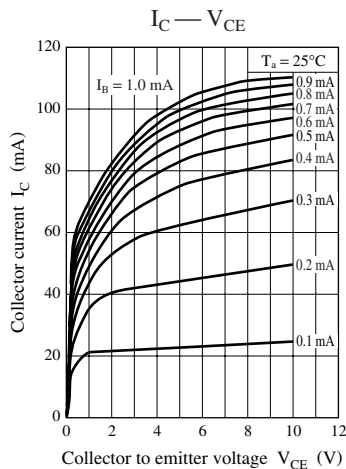
■ Electrical Characteristics (continued) $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

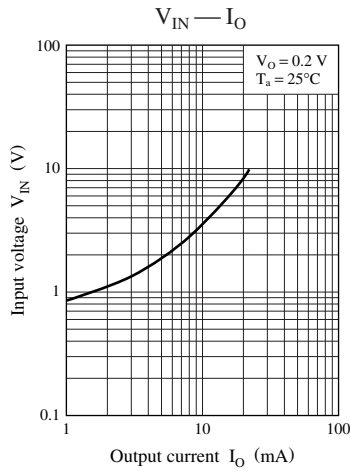
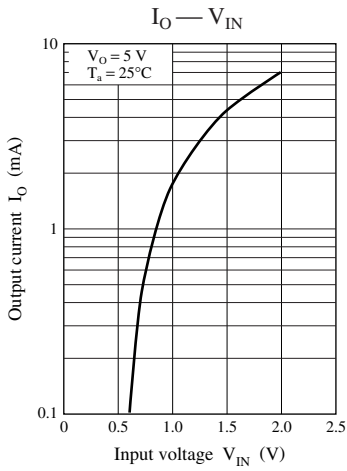
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
High-level output voltage	V_{OH}	$V_{CC} = 5\text{ V}, V_B = 0.5\text{ V}, R_L = 1\text{ k}\Omega$	4.9			V
Low-level output voltage	V_{OL}	$V_{CC} = 5\text{ V}, V_B = 2.5\text{ V}, R_L = 1\text{ k}\Omega$			0.2	V
		$V_{CC} = 5\text{ V}, V_B = 3.5\text{ V}, R_L = 1\text{ k}\Omega$				
Input resistance	R_1		-30%	4.7	+30%	k Ω
				10		
				47		
Resistance ratio	R_1 / R_2		0.8	1.0	1.2	
			0.17	0.21	0.25	
Gain bandwidth product	f_T	$V_{CB} = 10\text{ V}, I_E = -2\text{ mA}, f = 200\text{ MHz}$		150		MHz

Common characteristics chart

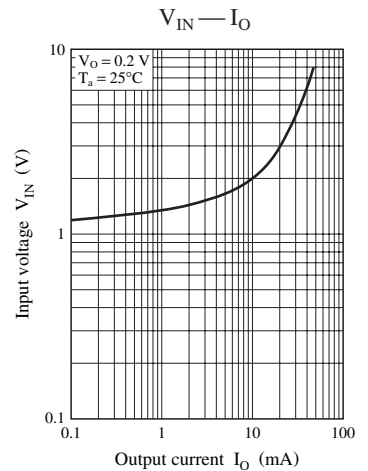
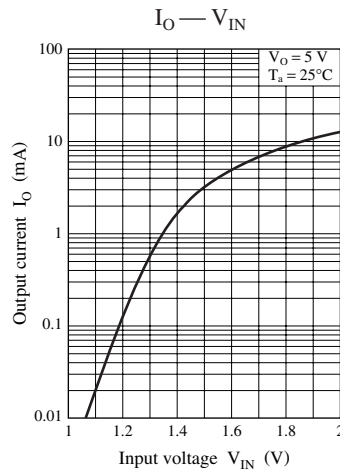
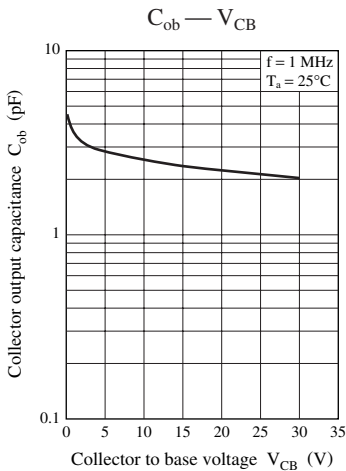
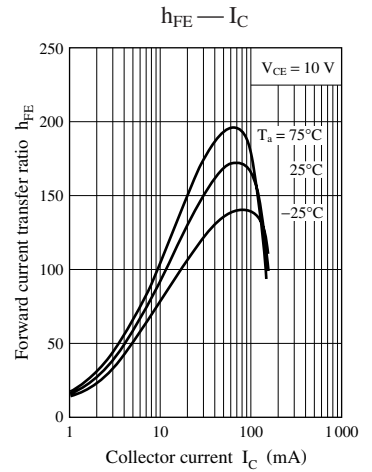
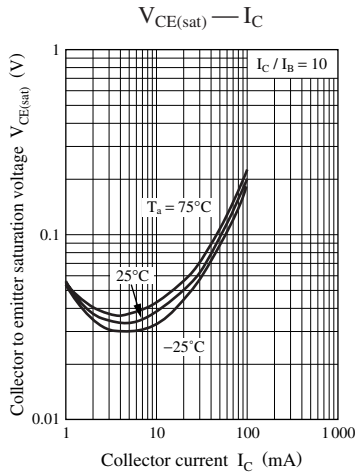
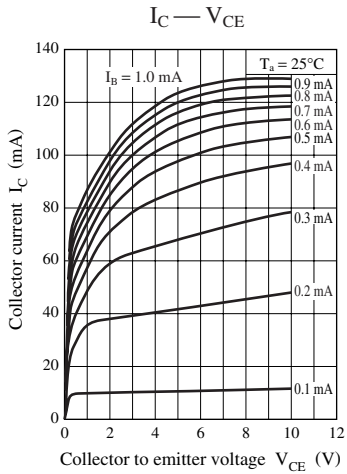


Characteristics charts of UP04210

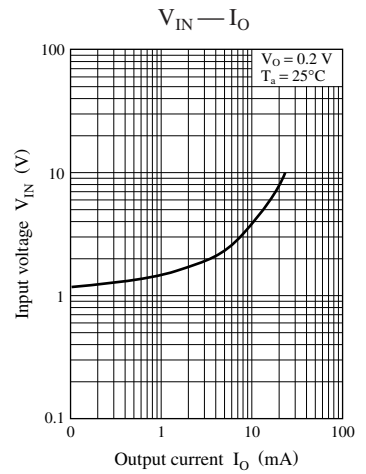
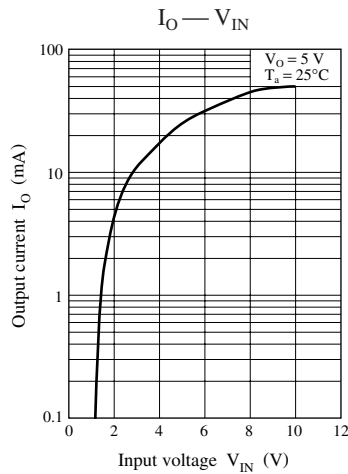
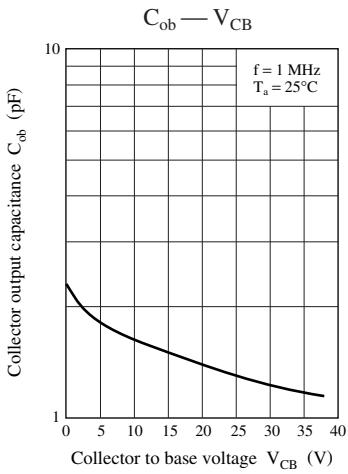
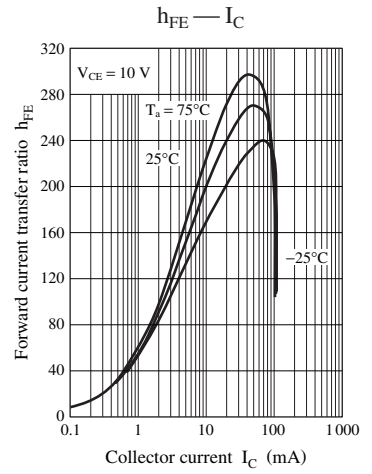
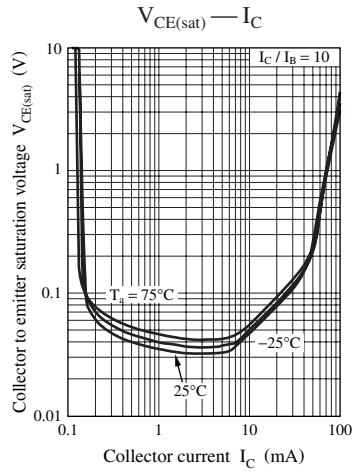
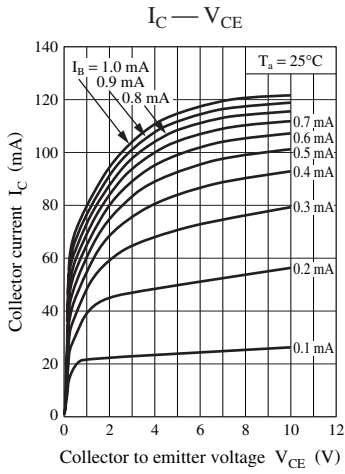




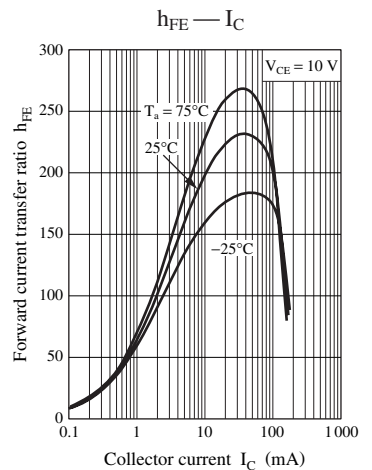
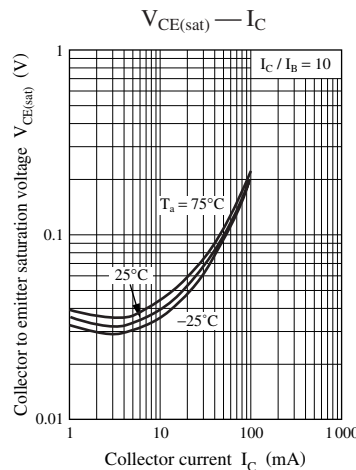
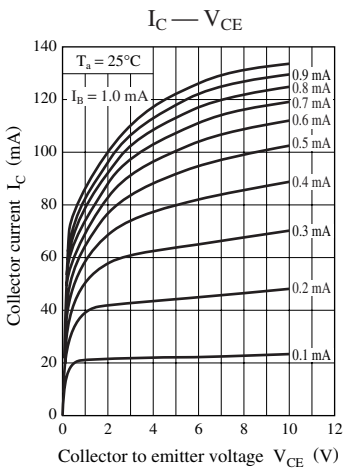
Characteristics charts of UP04211

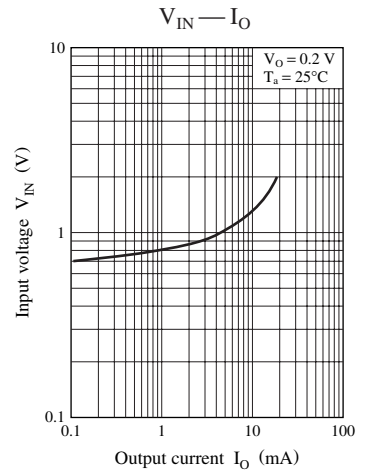
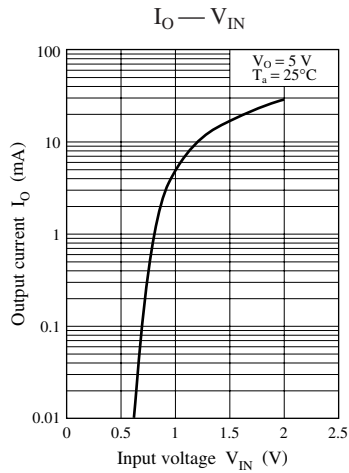
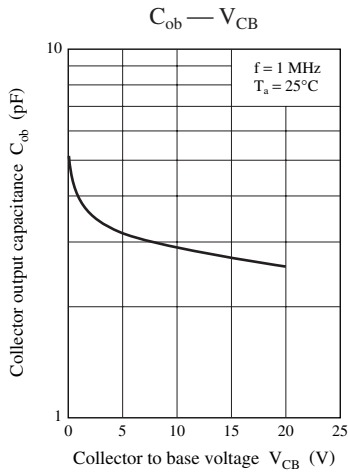


Characteristics charts of UP04213

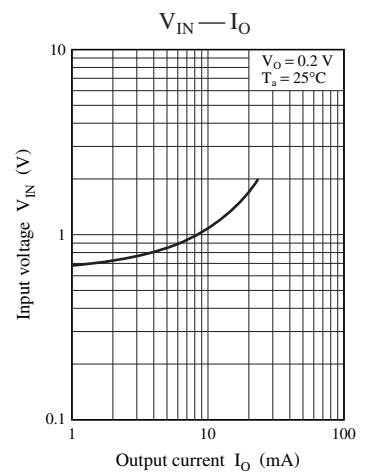
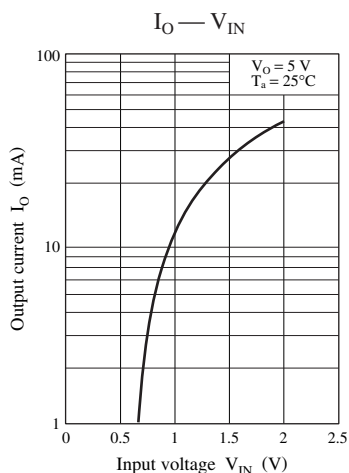
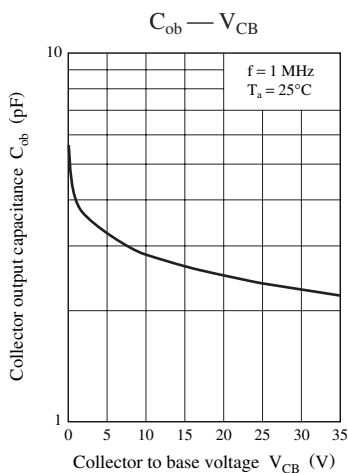
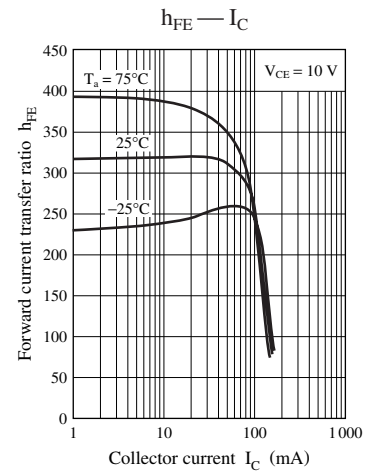
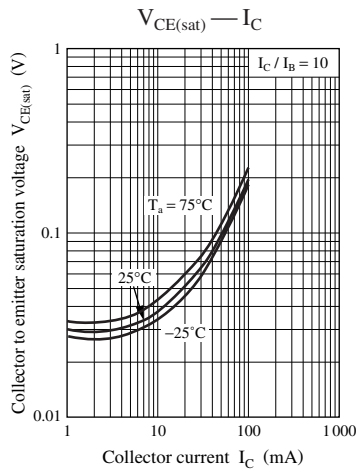
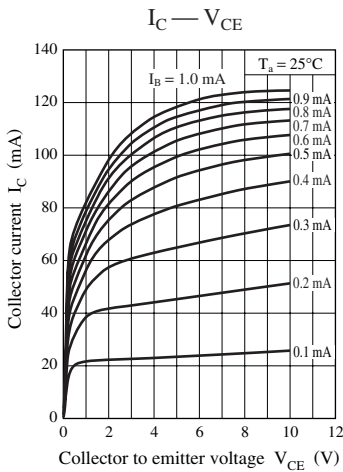


Characteristics charts of UP04214

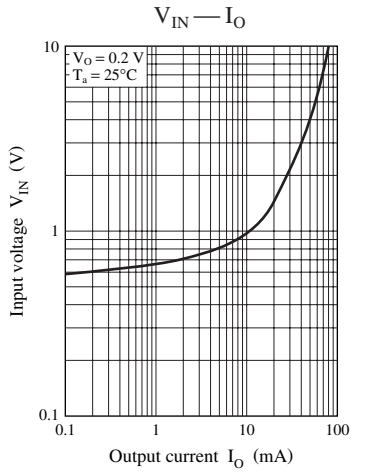
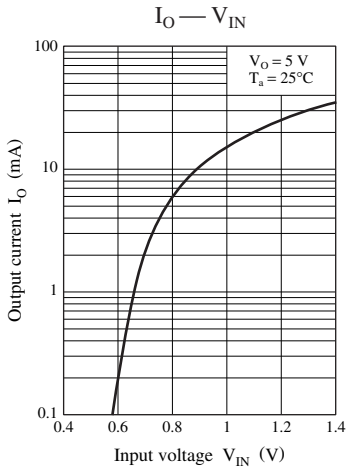
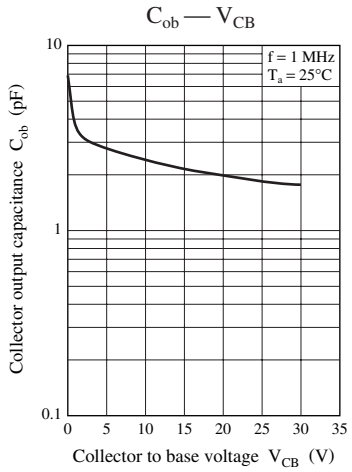
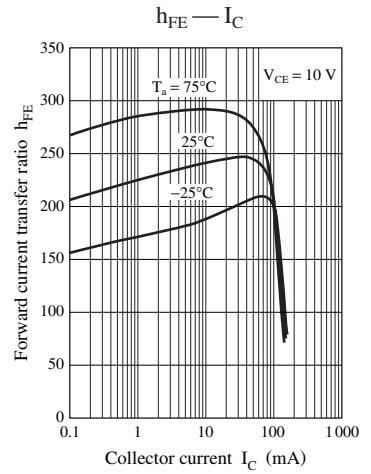
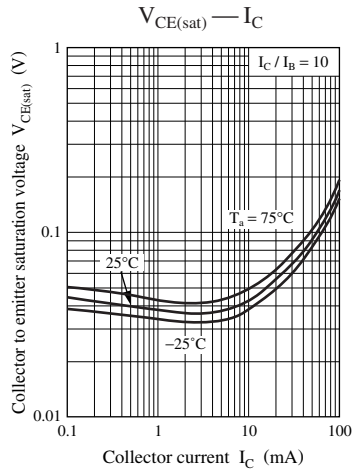
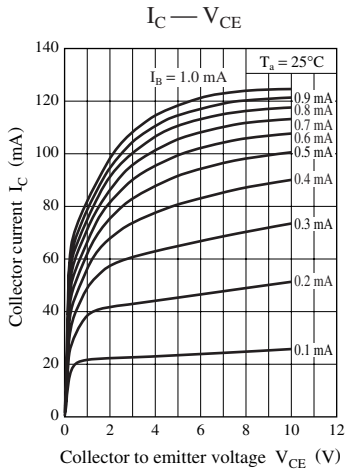




Characteristics charts of UP04215



Characteristics charts of UP04216



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