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UP0421x Series

Silicon NPN epitaxial planar type

For switching/digital circuits

■ Features

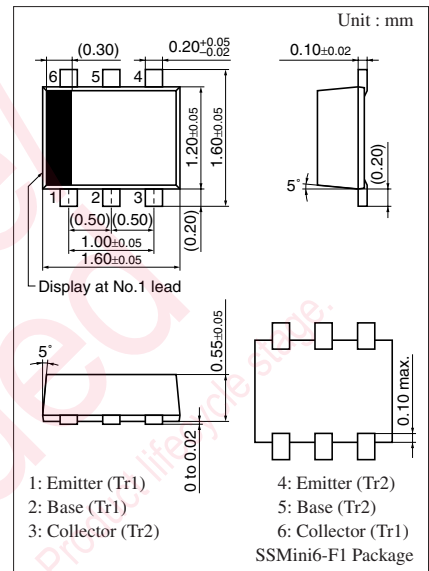
- Two elements incorporated into one package
(Transistors with built-in resistor)
- Reduction of the mounting area and assembly cost by one half

■ Resistance by Part Number

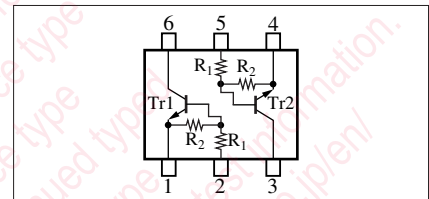
	Marking Symbol	(R ₁)	(R ₂)
• UP04210	8Z	47 kΩ	—
• UP04211	9V	10 kΩ	10 kΩ
• UP04213	8S	47 kΩ	47 kΩ
• UP04214	BR	10 kΩ	47 kΩ
• UP04215	8T	10 kΩ	—
• UP04216	8U	4.7 kΩ	—

■ Absolute Maximum Ratings T_a = 25°C

Parameter	Symbol	Rating	Unit
Collector-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



Internal Connection

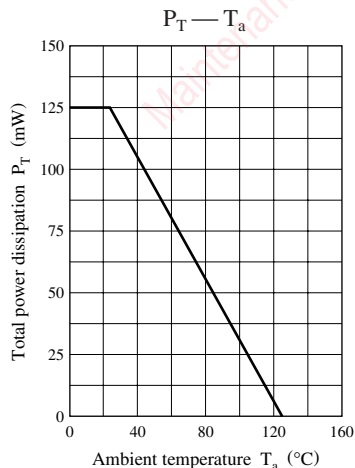


■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

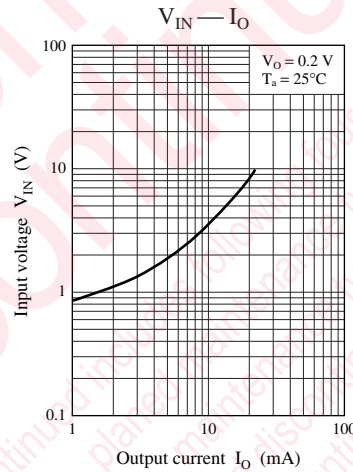
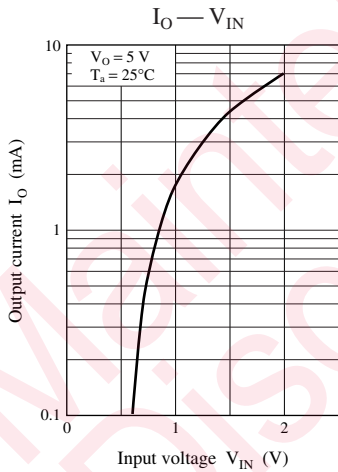
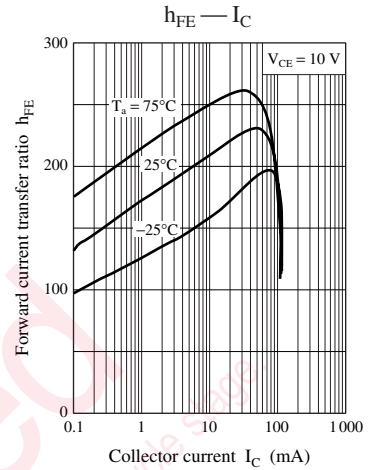
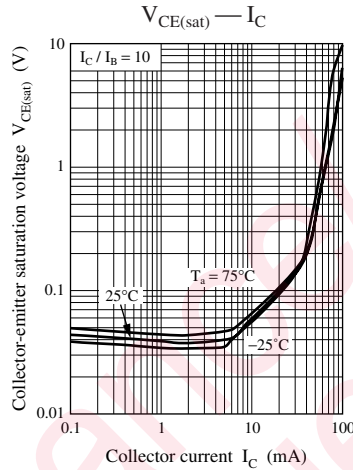
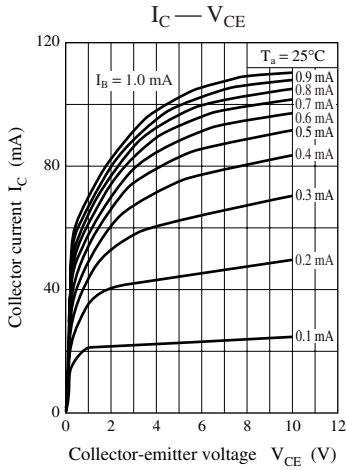
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)		V_{CBO}	$I_C = 10 \mu\text{A}, I_E = 0$	50			V
Collector-emitter voltage (Base open)		V_{CEO}	$I_C = 2 \text{ mA}, I_B = 0$	50			V
Collector-base cutoff current (Emitter open)		I_{CBO}	$V_{CB} = 50 \text{ V}, I_E = 0$			0.1	μA
Collector-emitter cutoff current (Base open)		I_{CEO}	$V_{CE} = 50 \text{ V}, I_B = 0$			0.5	μA
Emitter-base cutoff current (Collector open)	UP04210/4215/4216	I_{EBO}	$V_{EB} = 6 \text{ V}, I_C = 0$			0.01	mA
	UP04211					0.5	
	UP04213					0.1	
	UP04214					0.2	
Forward current transfer ratio	UP04210/4215/4216	h_{FE}	$V_{CE} = 10 \text{ V}, I_C = 5 \text{ mA}$	160		460	—
	UP04211			35			
	UP04213/4214			80			
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = 10 \text{ mA}, I_B = 0.3 \text{ mA}$			0.25	V
Output voltage high-level		V_{OH}	$V_{CC} = 5 \text{ V}, V_B = 0.5 \text{ V}, R_L = 1 \text{ k}\Omega$	4.9			V
Output voltage low-level		V_{OL}	$V_{CC} = 5 \text{ V}, V_B = 2.5 \text{ V}, R_L = 1 \text{ k}\Omega$			0.2	V
Input resistance	UP04213	R_1	$V_{CC} = 5 \text{ V}, V_B = 3.5 \text{ V}, R_L = 1 \text{ k}\Omega$				k Ω
	UP04210/4213			-30%	47	+30%	
	UP04211/4214/4215				10		
	UP04216			4.7			
Resistance ratio	UP04211/4213	R_1 / R_2		0.8	1.0	1.2	—
	UP04214			0.17	0.21	0.25	
Transition frequency		f_T	$V_{CB} = 10 \text{ V}, I_E = -2 \text{ mA}, f = 200 \text{ MHz}$		150		MHz

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

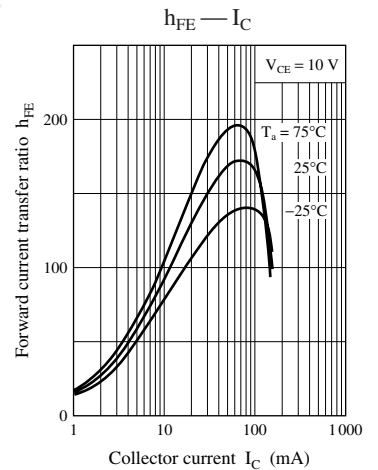
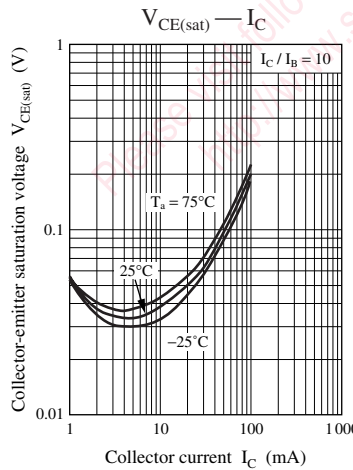
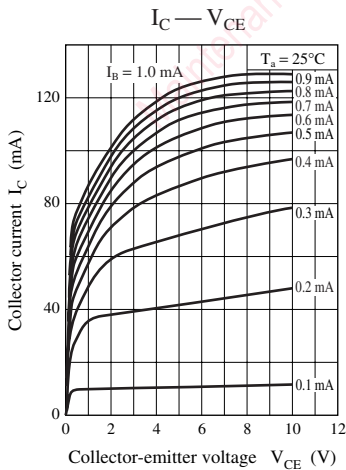
Common characteristics chart

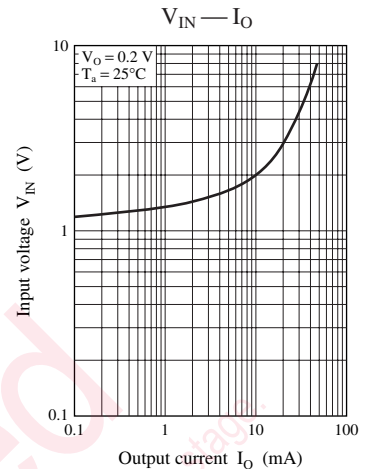
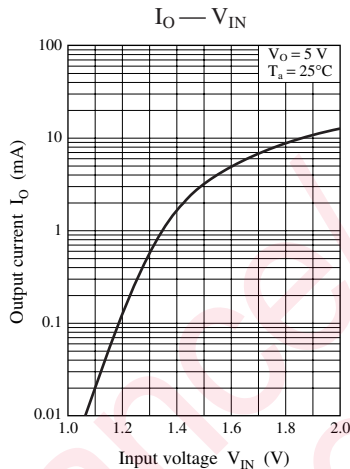
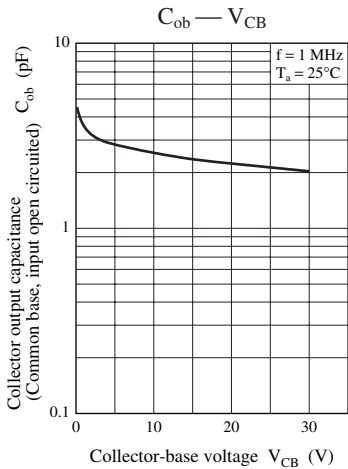


Characteristics charts of UP04210

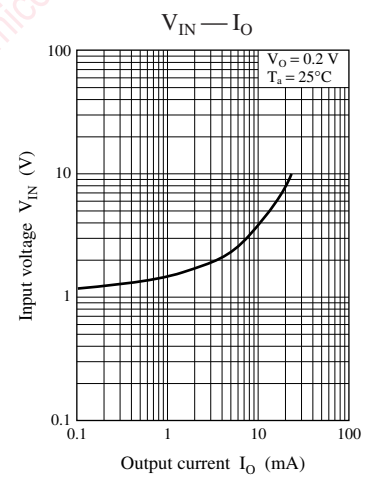
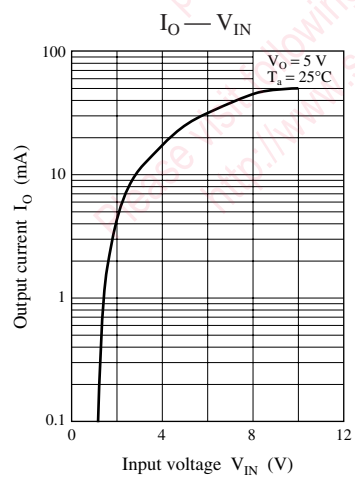
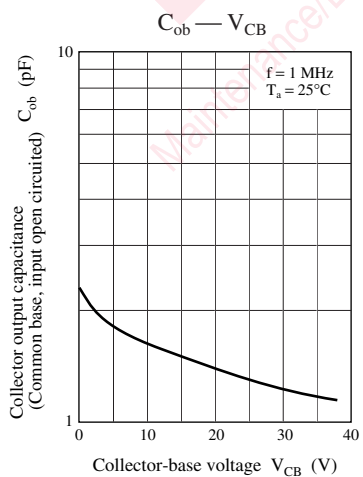
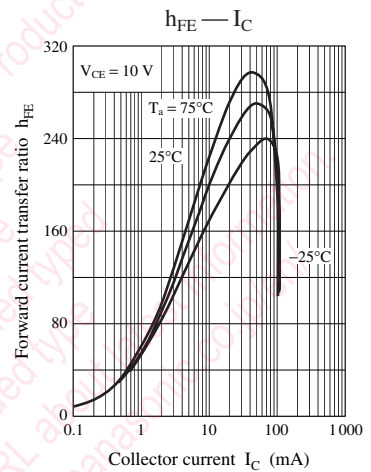
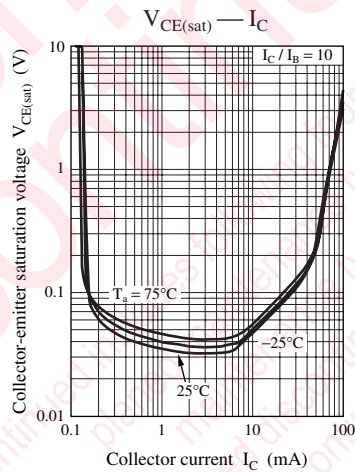
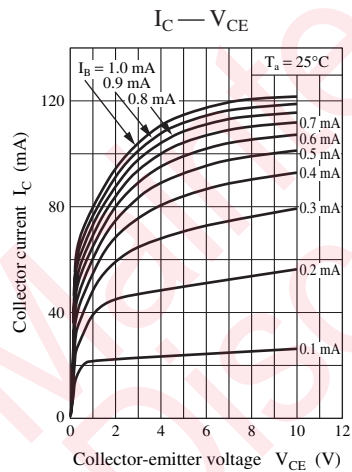


Characteristics charts of UP04211

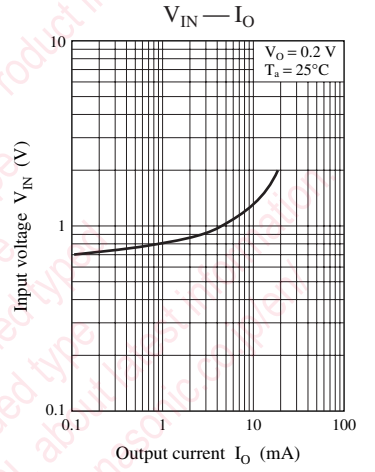
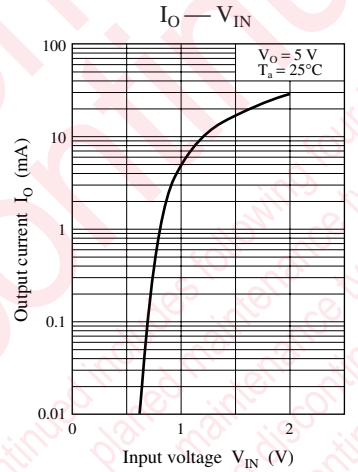
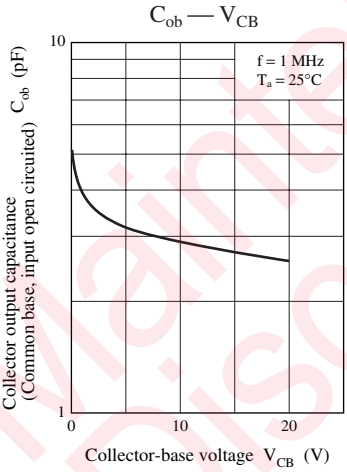
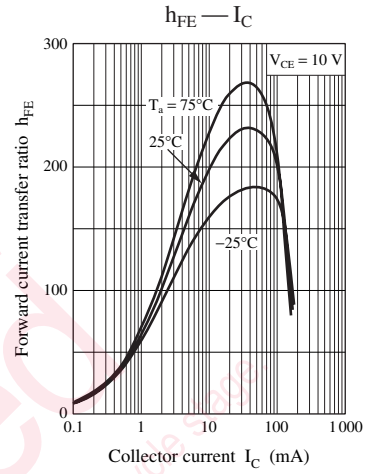
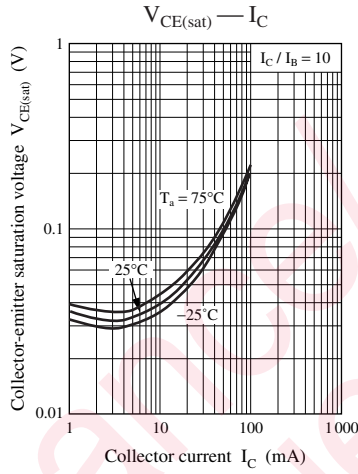
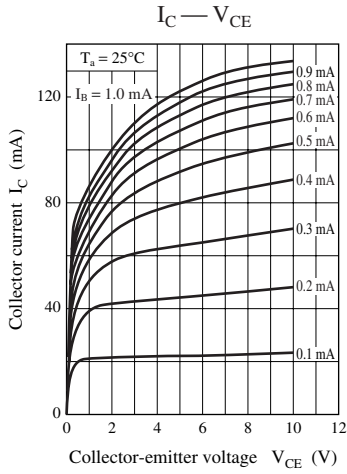




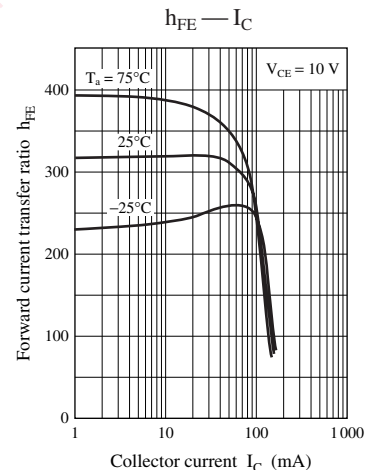
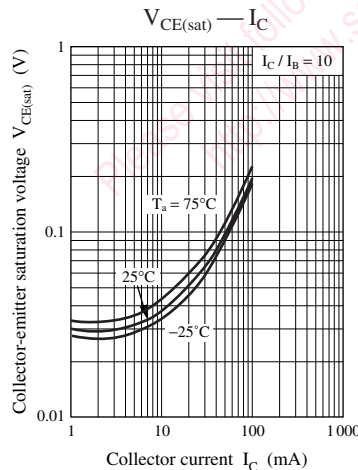
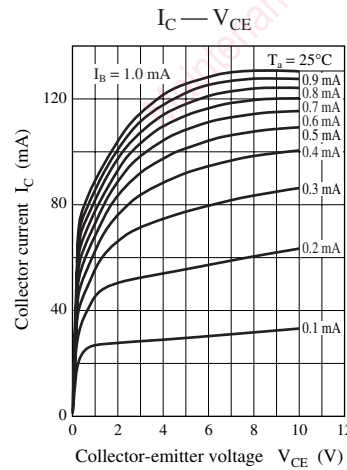
Characteristics charts of UP04213

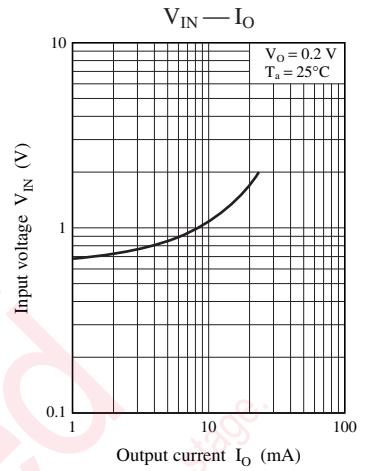
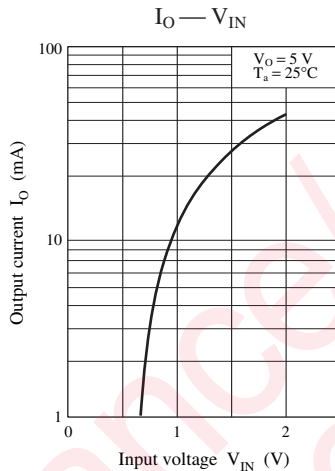
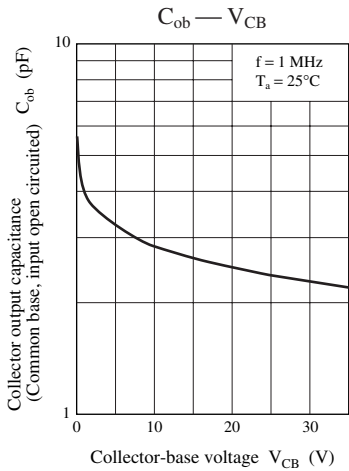


Characteristics charts of UP04214

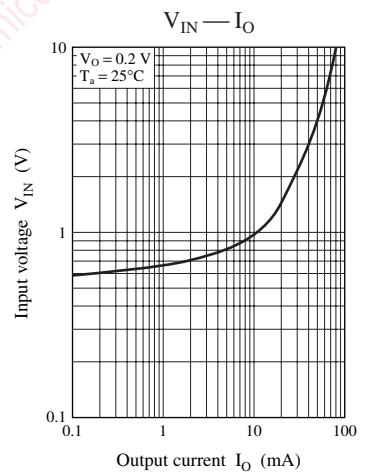
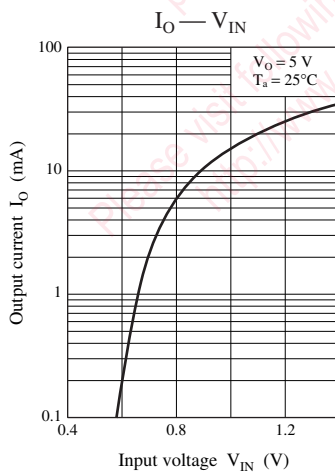
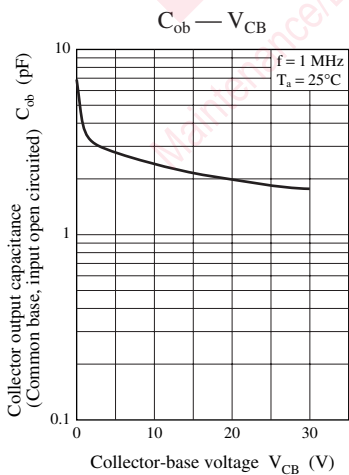
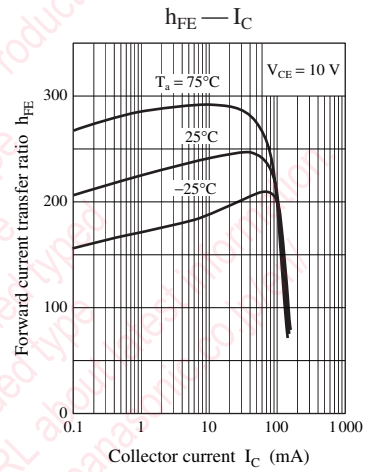
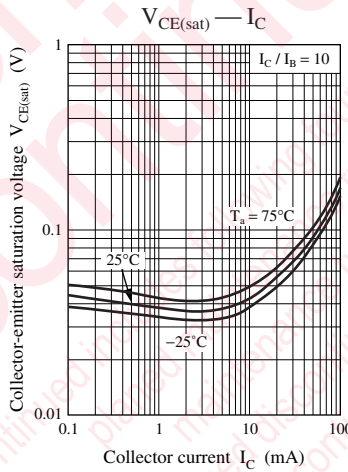
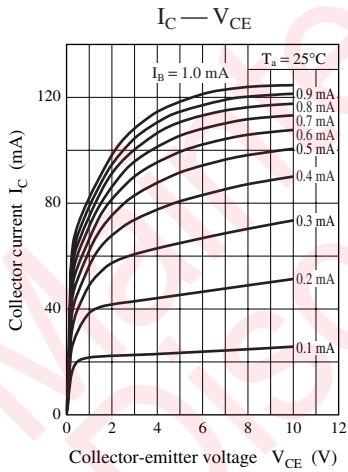


Characteristics charts of UP04215





Characteristics charts of UP04216



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