

# XP0431N

Silicon NPN epitaxial planer transistor (Tr1)  
 Silicon PNP epitaxial planer transistor (Tr2)

For switching/digital circuits

**Features**

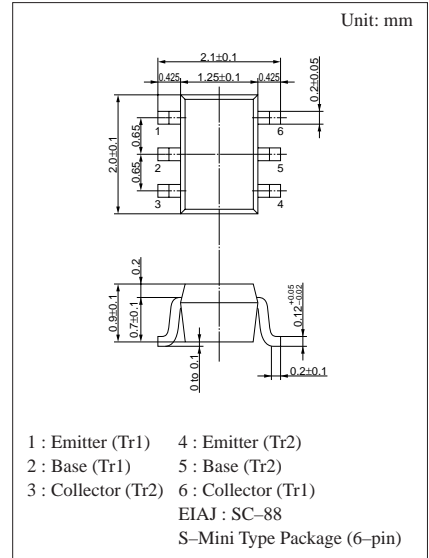
- Two elements incorporated into one package.  
 (Transistors with built-in resistor)
- Reduction of the mounting area and assembly cost by one half.

**Basic Part Number of Element**

- UN221N+UN211N

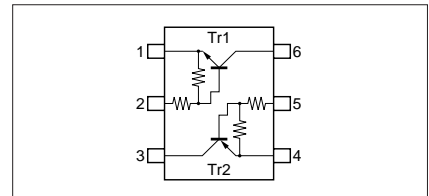
**Absolute Maximum Ratings (Ta=25°C)**

	Parameter	Symbol	Ratings	Unit
Tr1	Collector to base voltage	$V_{CBO}$	50	V
	Collector to emitter voltage	$V_{CEO}$	50	V
	Collector current	$I_C$	100	mA
Tr2	Collector to base voltage	$V_{CBO}$	-50	V
	Collector to emitter voltage	$V_{CEO}$	-50	V
	Collector current	$I_C$	-100	mA
Overall	Total power dissipation	$P_T$	150	mW
	Junction temperature	$T_j$	150	°C
	Storage temperature	$T_{sig}$	-55 to +150	°C



Marking Symbol: HC

Internal Connection



### ■ Electrical Characteristics (Ta=25°C)

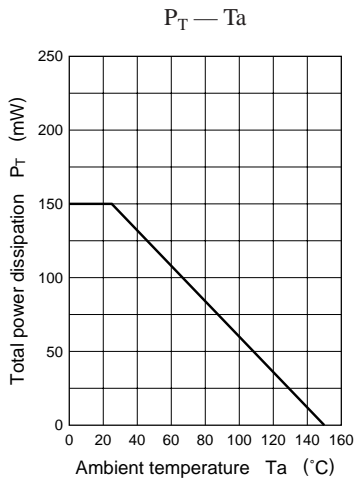
#### ● Tr1

Parameter	Symbol	Conditions	min	typ	max	Unit
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
Collector cutoff current	$I_{CBO}$	$V_{CB} = 50V, I_E = 0$			0.1	$\mu A$
	$I_{CEO}$	$V_{CE} = 50V, I_B = 0$			0.5	$\mu A$
Emitter cutoff current	$I_{EBO}$	$V_{EB} = 6V, I_C = 0$			2	mA
Forward current transfer ratio	$h_{FE}$	$V_{CE} = 10V, I_C = 5mA$	80			
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = 10mA, I_B = 0.3mA$			0.3	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
Input resistance	$R_1$		-30%	4.7	+30%	k $\Omega$
Resistance ratio	$R_1/R_2$		0.08	0.1	0.12	
Transition frequency	$f_T$	$V_{CB} = 10V, I_E = -2mA, f = 200MHz$		150		MHz

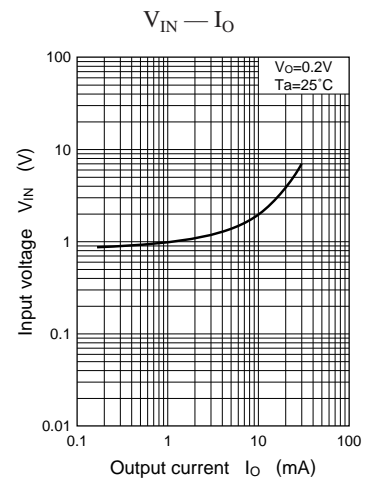
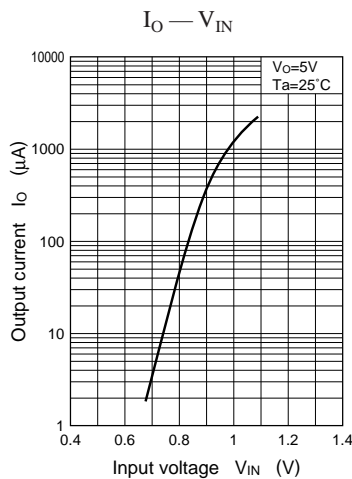
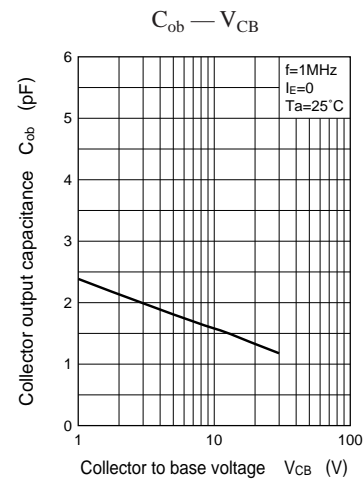
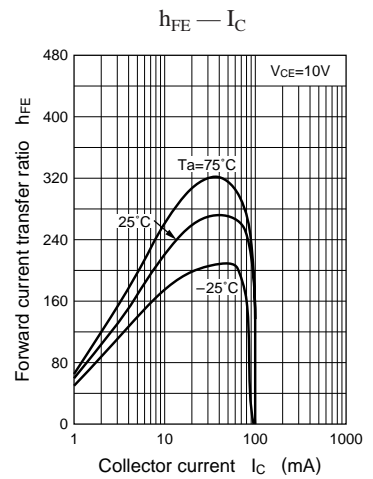
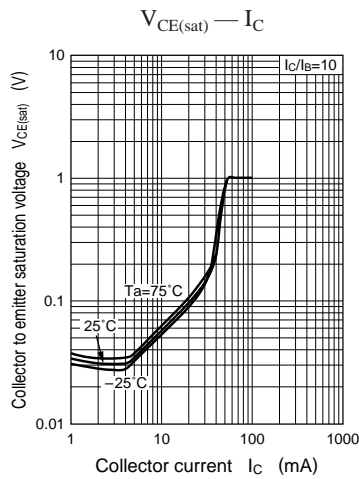
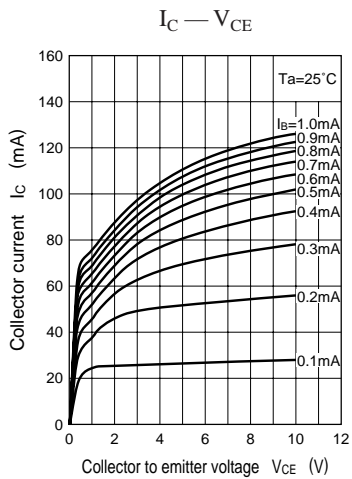
#### ● Tr2

Parameter	Symbol	Conditions	min	typ	max	Unit
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
Collector cutoff current	$I_{CBO}$	$V_{CB} = -50V, I_E = 0$			-0.1	$\mu A$
	$I_{CEO}$	$V_{CE} = -50V, I_B = 0$			-0.5	$\mu A$
Emitter cutoff current	$I_{EBO}$	$V_{EB} = -6V, I_C = 0$			-2	mA
Forward current transfer ratio	$h_{FE}$	$V_{CE} = -10V, I_C = -5mA$	80			
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = -10mA, I_B = -0.3mA$			-0.3	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
Input resistance	$R_1$		-30%	4.7	+30%	k $\Omega$
Resistance ratio	$R_1/R_2$		0.08	0.1	0.12	
Transition frequency	$f_T$	$V_{CB} = -10V, I_E = 2mA, f = 200MHz$		150		MHz

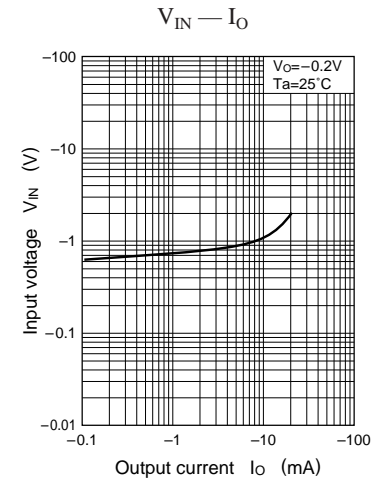
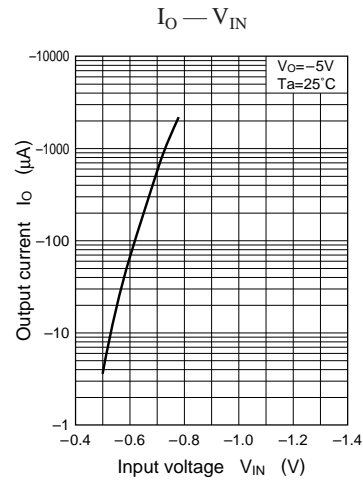
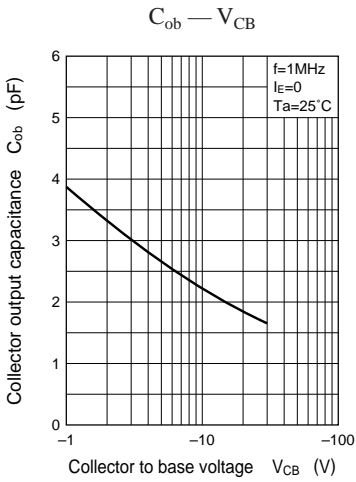
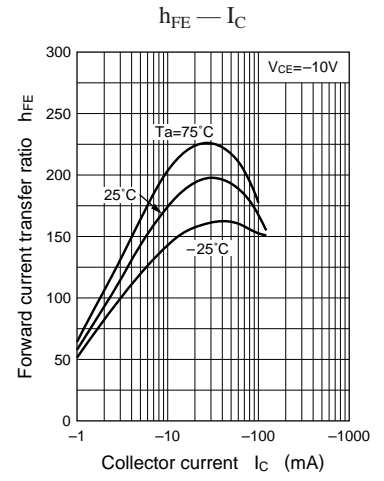
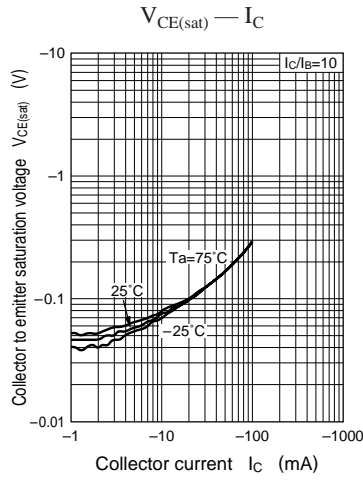
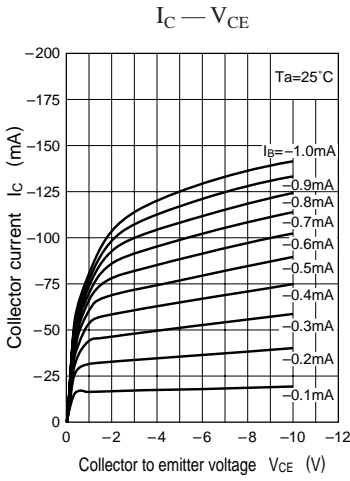
Common characteristics chart



Characteristics charts of Tr1



Characteristics charts of Tr2



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