

# UP04111/4113/4116

## Silicon PNP epitaxial planar transistor

For switching/digital circuits

### ■ Features

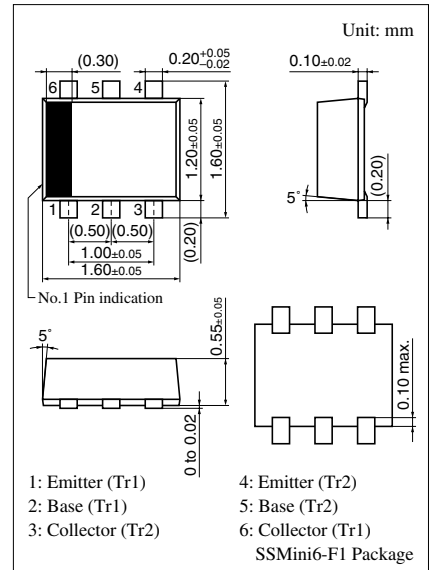
- Two elements incorporated into one package  
(Transistor with built-in resistor)
- Reduction of the mounting area and assembly cost by one half

### ■ Resistance by Part Number

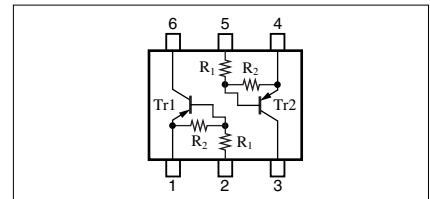
	Marking Symbol	(R <sub>1</sub> )	(R <sub>2</sub> )
• UP04111	9U	10 kΩ	10 kΩ
• UP04113	6S	47 kΩ	47 kΩ
• UP04116	6U	4.7 kΩ	—

### ■ Absolute Maximum Ratings T<sub>a</sub> = 25°C

Parameter	Symbol	Rating	Unit
Collector to base voltage	V <sub>CBO</sub>	-50	V
Collector to emitter voltage	V <sub>CEO</sub>	-50	V
Collector current	I <sub>C</sub>	-100	mA
Total power dissipation	P <sub>T</sub>	125	mW
Junction temperature	T <sub>j</sub>	125	°C
Storage temperature	T <sub>stg</sub>	-55 to +125	°C



### Internal Connection



### ■ Electrical Characteristics T<sub>a</sub> = 25°C ± 3°C

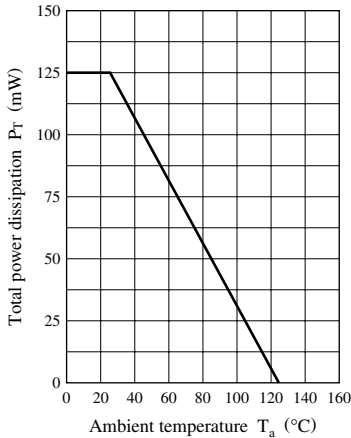
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector cutoff current	I <sub>CBO</sub>	V <sub>CB</sub> = -50 V, I <sub>E</sub> = 0			-0.1	μA
	I <sub>CEO</sub>	V <sub>CE</sub> = -50 V, I <sub>B</sub> = 0			-0.5	
Emitter cutoff current	UP04111 UP04113 UP04116	I <sub>EBO</sub> V <sub>EB</sub> = -6 V, I <sub>C</sub> = 0			-0.5	mA
					-0.1	
					-0.01	
Collector to base voltage	V <sub>CBO</sub>	I <sub>C</sub> = -10 μA, I <sub>E</sub> = 0	-50			V
Collector to emitter voltage	V <sub>CEO</sub>	I <sub>C</sub> = -2 mA, I <sub>B</sub> = 0	-50			V
Forward current transfer ratio	UP04111 UP04113 UP04116	h <sub>FE</sub> V <sub>CE</sub> = -10 V, I <sub>C</sub> = -5 mA	35			
			80			
			160	460		
Collector to emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = -10 mA, I <sub>B</sub> = -0.3 mA			-0.25	V

■ 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
		$V_{CC} = -5\text{ V}, V_B = -3.5\text{ V}, R_L = 1\text{ k}\Omega$				
Gain bandwidth product	$f_T$	$V_{CB} = -10\text{ V}, I_E = 1\text{ mA}, f = 200\text{ MHz}$		80		MHz
Input resistance	UP04116	$R_1$	-30%	4.7	+30%	k $\Omega$
	UP04111			10		
	UP04113			47		
Resistance ratio	UP04111/4113	$R_1/R_2$	0.8	1.0	1.2	

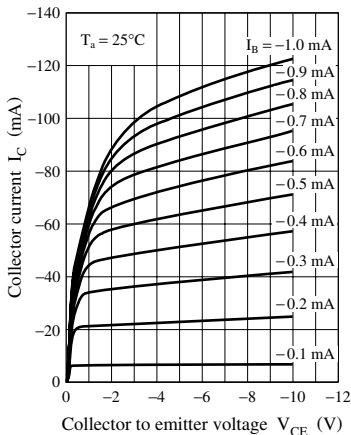
Common characteristics chart

$P_T - T_a$

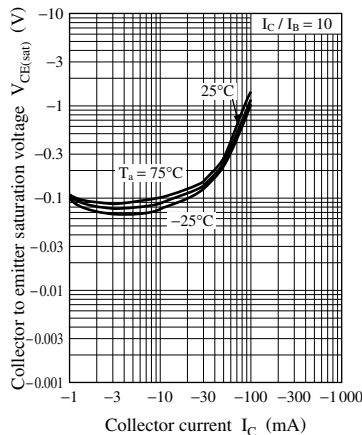


Characteristics chart of UP04111

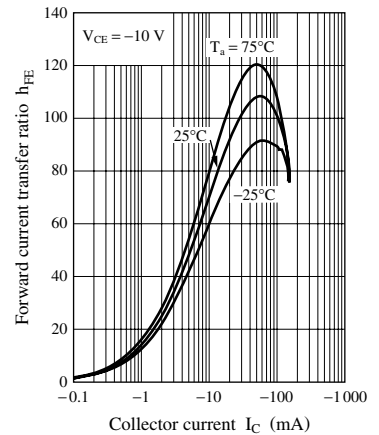
$I_C - V_{CE}$

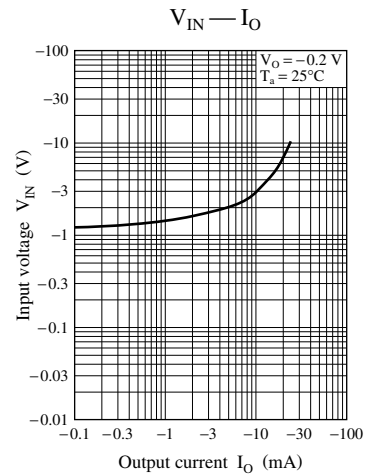
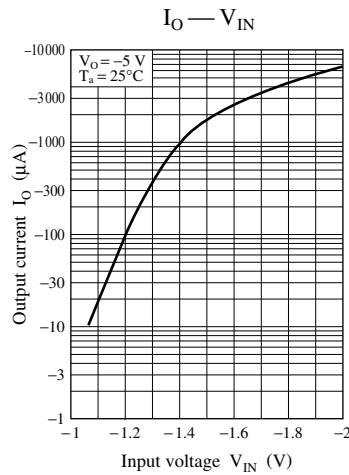
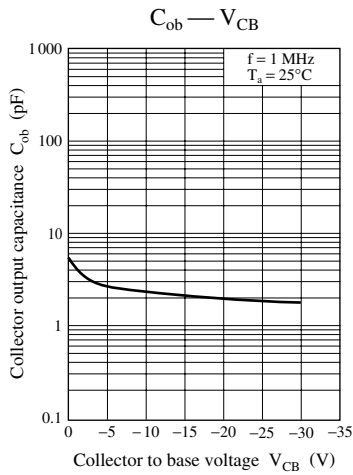


$V_{CE(sat)} - I_C$

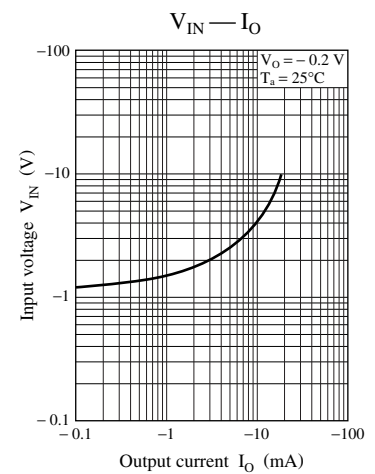
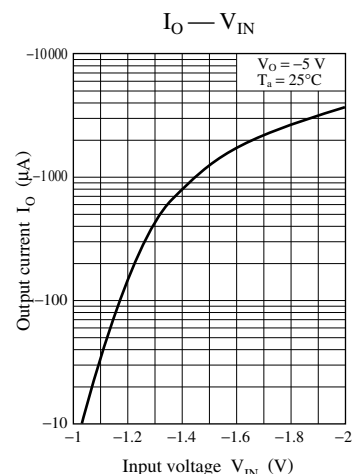
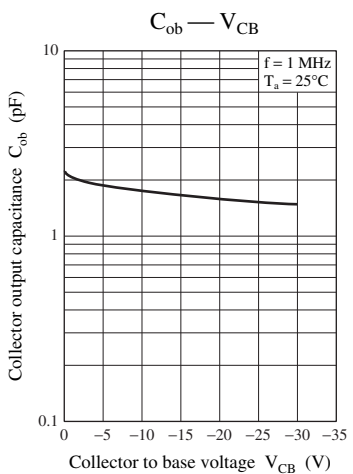
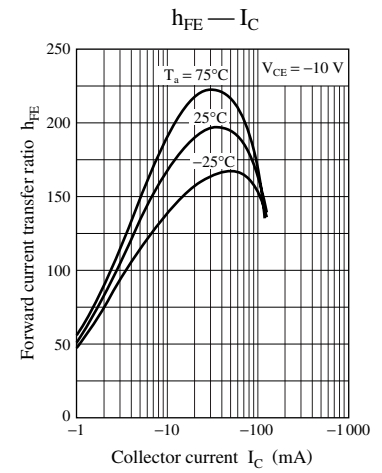
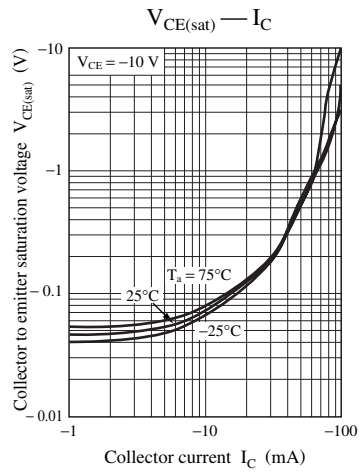
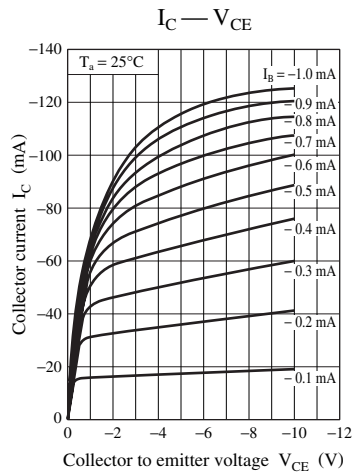


$h_{FE} - I_C$

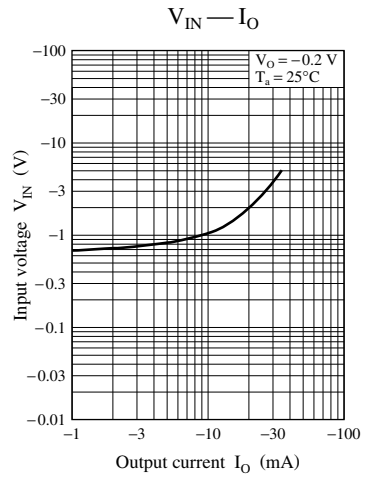
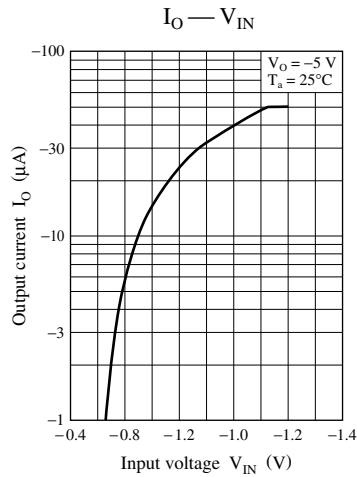
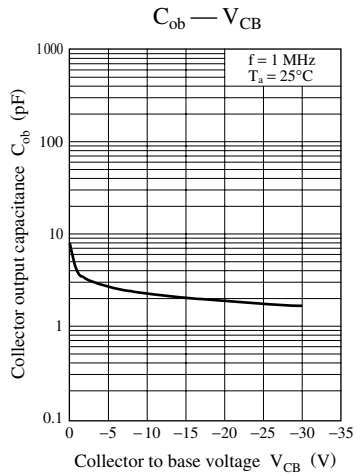
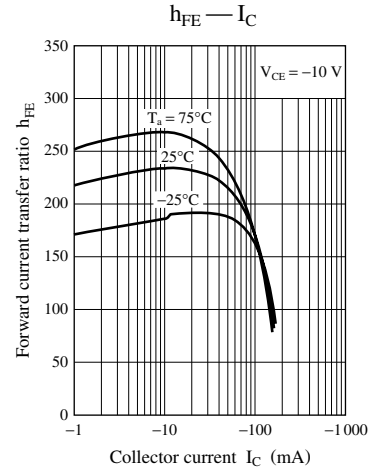
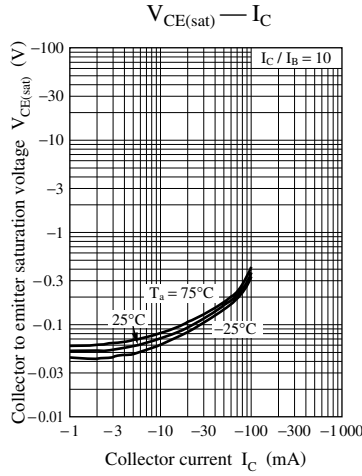
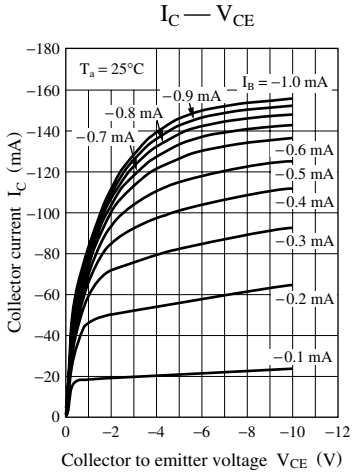




Characteristics chart of UP04113



Characteristics chart of UP04116



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