

# UP04316

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

For switching  
For digital circuit

## ■ 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

- UNR1216 (UN1216) + UNR1116 (UN1116)

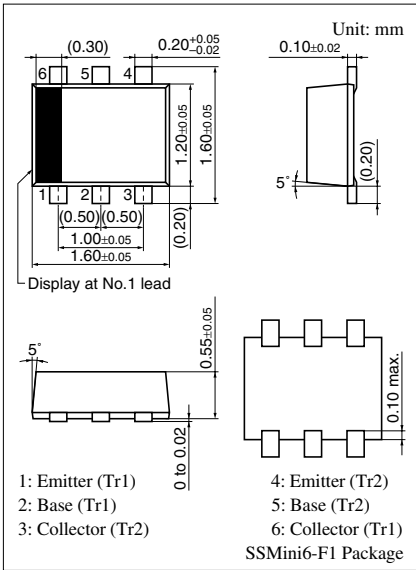
## ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

	Parameter	Symbol	Rating	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	$P_T$	125	mW
	Junction temperature	$T_j$	125	$^\circ\text{C}$
	Storage temperature	$T_{stg}$	-55 to +125	$^\circ\text{C}$

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

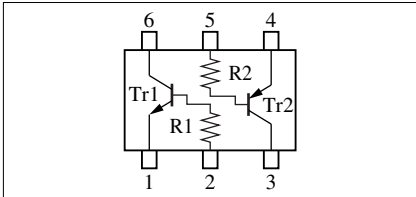
- Tr1

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector to base voltage	$V_{CBO}$	$I_C = 10 \mu\text{A}$ , $I_E = 0$	50			V
Collector to emitter voltage	$V_{CEO}$	$I_C = 2 \text{ mA}$ , $I_B = 0$	50			V
Collector cutoff current	$I_{CBO}$	$V_{CB} = 50 \text{ V}$ , $I_E = 0$			0.1	$\mu\text{A}$
	$I_{CEO}$	$V_{CE} = 50 \text{ V}$ , $I_B = 0$			0.5	
Emitter cutoff current	$I_{EBO}$	$V_{EB} = 6 \text{ V}$ , $I_C = 0$			0.01	mA
Forward current transfer ratio	$h_{FE}$	$V_{CE} = 10 \text{ V}$ , $I_C = 5 \text{ mA}$	160		460	
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = 10 \text{ mA}$ , $I_B = 0.3 \text{ mA}$			0.25	V
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
Input resistance	$R_i$		-30%	4.7	+30%	$\text{k}\Omega$
Transition frequency	$f_T$	$V_{CB} = 10 \text{ V}$ , $I_E = -2 \text{ mA}$ , $f = 200 \text{ MHz}$		150		MHz



Marking Symbol: 7U

Internal Connection



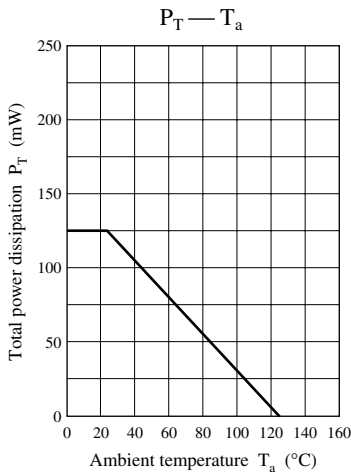
Note) The part number in the parenthesis shows conventional part number.

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

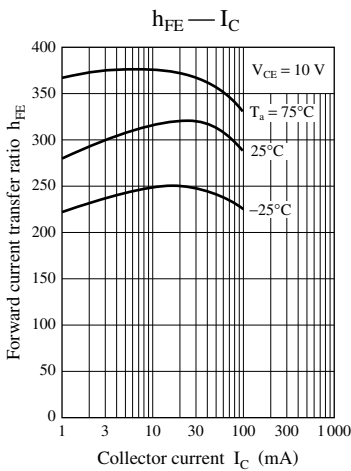
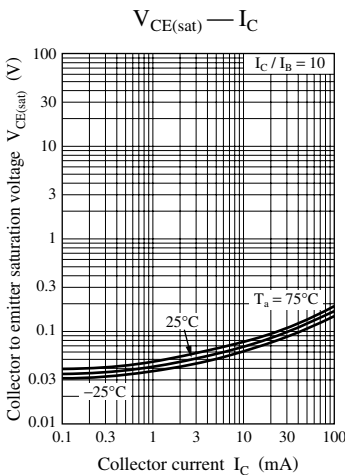
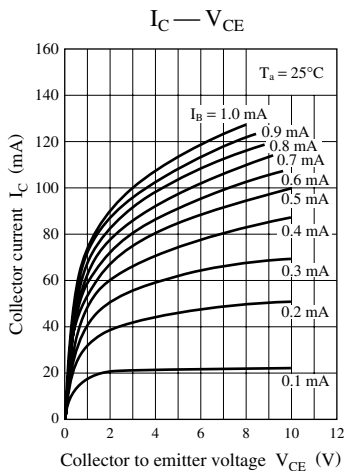
• Tr2

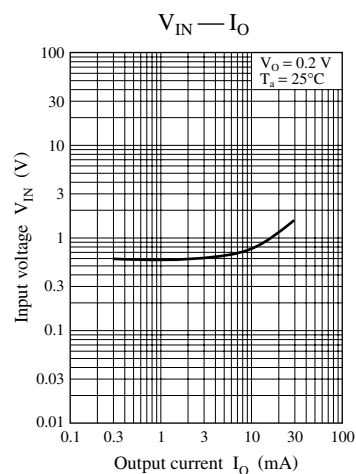
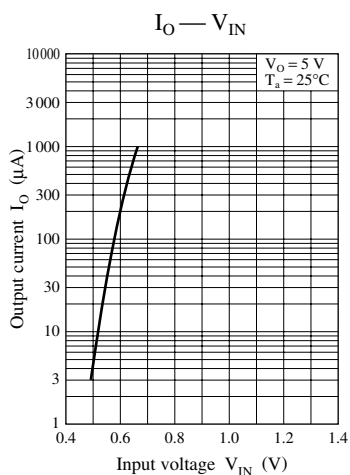
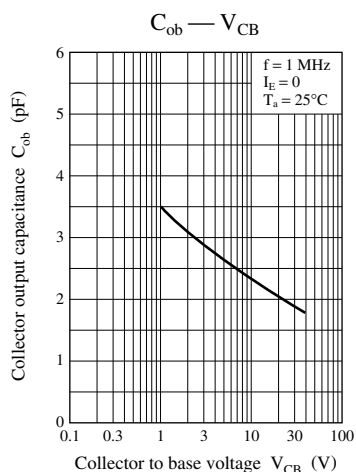
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector to base voltage	$V_{\text{CBO}}$	$I_{\text{C}} = -10\ \mu\text{A}$ , $I_{\text{E}} = 0$	-50			V
Collector to emitter voltage	$V_{\text{CEO}}$	$I_{\text{C}} = -2\ \text{mA}$ , $I_{\text{B}} = 0$	-50			V
Collector cutoff current	$I_{\text{CBO}}$	$V_{\text{CB}} = -50\ \text{V}$ , $I_{\text{E}} = 0$			-0.1	$\mu\text{A}$
	$I_{\text{CEO}}$	$V_{\text{CE}} = -50\ \text{V}$ , $I_{\text{B}} = 0$			-0.5	$\mu\text{A}$
Emitter cutoff current	$I_{\text{EBO}}$	$V_{\text{EB}} = -6\ \text{V}$ , $I_{\text{C}} = 0$			-0.5	mA
Forward current transfer ratio	$h_{\text{FE}}$	$V_{\text{CE}} = -10\ \text{V}$ , $I_{\text{C}} = -5\ \text{mA}$	160		460	
Collector to emitter saturation voltage	$V_{\text{CE(sat)}}$	$I_{\text{C}} = -10\ \text{mA}$ , $I_{\text{B}} = -0.3\ \text{mA}$			-0.25	V
High-level output voltage	$V_{\text{OH}}$	$V_{\text{CC}} = -5\ \text{V}$ , $V_{\text{B}} = -0.5\ \text{V}$ , $R_{\text{L}} = 1\ \text{k}\Omega$	-4.9			V
Low-level output voltage	$V_{\text{OL}}$	$V_{\text{CC}} = -5\ \text{V}$ , $V_{\text{B}} = -2.5\ \text{V}$ , $R_{\text{L}} = 1\ \text{k}\Omega$			-0.2	V
Input resistance	$R_{\text{I}}$		-30%	4.7	+30%	$\text{k}\Omega$
Transition frequency	$f_{\text{T}}$	$V_{\text{CB}} = -10\ \text{V}$ , $I_{\text{E}} = 1\ \text{mA}$ , $f = 200\ \text{MHz}$		80		MHz

Common characteristics chart

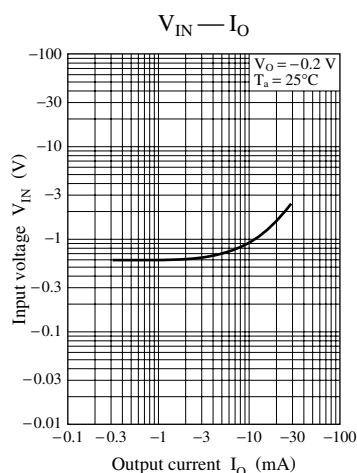
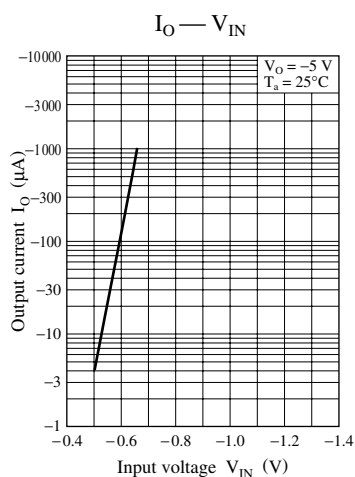
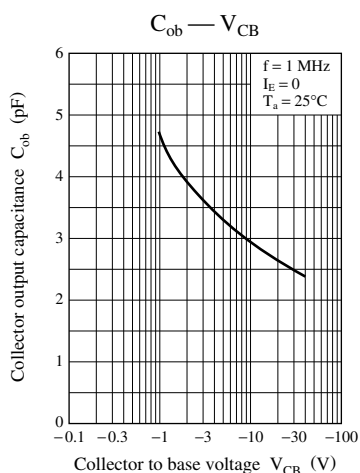
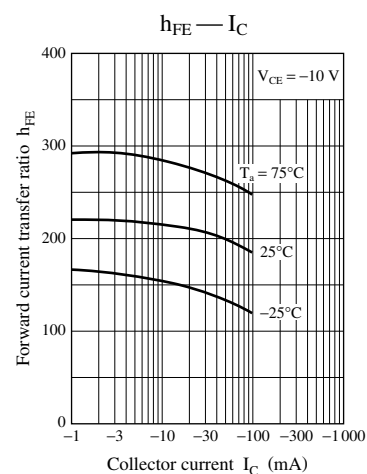
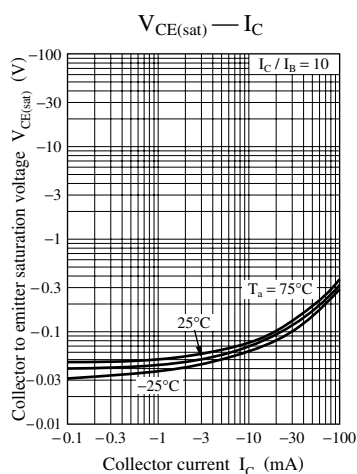
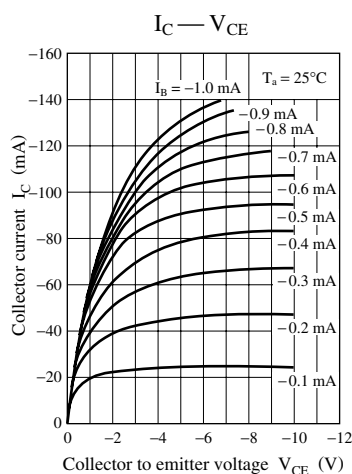


Characteristics chart of Tr1





Characteristics chart of Tr2



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