

XN04390

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

For digital circuit

For switching

■ Features

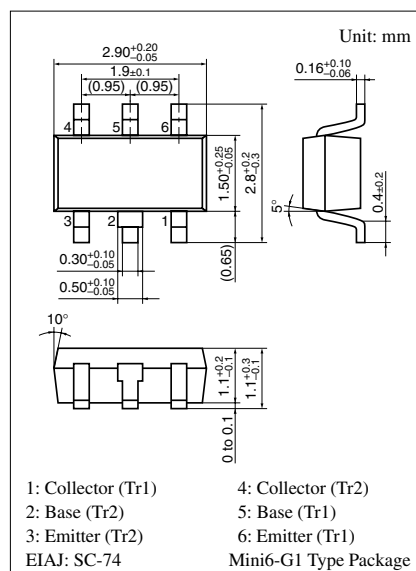
- Two elements incorporated into one package.
(Transistor with built-in resistor)
- Reduction of the mounting area and assembly cost by one half.

■ Basic Part Number of Element

- UNR212X (UN212X) + UNR2223 (UN2223)

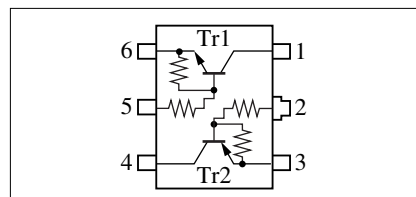
■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

	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	500	mA
Tr2	Collector to base voltage	V_{CBO}	-50	V
	Collector to emitter voltage	V_{CEO}	-50	V
	Collector current	I_C	-500	mA
Overall	Total power dissipation	P_T	300	mW
	Junction temperature	T_j	150	$^\circ\text{C}$
	Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$



Marking Symbol: DY

Internal Connection



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

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

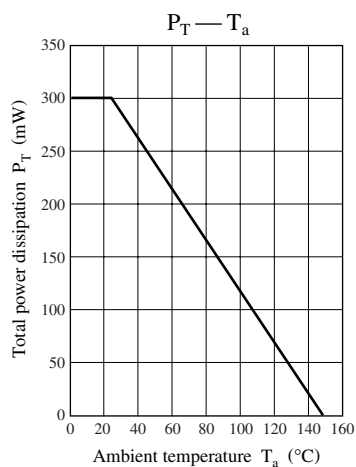
• Tr1

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}	$V_{CB} = 50\ \text{V}$, $I_E = 0$			1	μA
	I_{CEO}	$V_{CE} = 50\ \text{V}$, $I_B = 0$			1	μA
Emitter cutoff current	I_{EBO}	$V_{EB} = 6\ \text{V}$, $I_C = 0$			1	mA
Forward current transfer ratio	h_{FE}	$V_{CE} = 10\ \text{V}$, $I_C = 100\ \text{mA}$	60			
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = 100\ \text{mA}$, $I_B = 5\ \text{mA}$			0.25	V
High-level output voltage	V_{OH}	$V_{CC} = 5\ \text{V}$, $V_B = 0.5\ \text{V}$, $R_L = 500\ \Omega$	4.9			V
Low-level output voltage	V_{OL}	$V_{CC} = 5\ \text{V}$, $V_B = 3.5\ \text{V}$, $R_L = 500\ \Omega$			0.2	V
Input resistance	R_1		-30%	10	+30%	k Ω
Resistance ratio	R_1/R_2		0.8	1.0	1.2	
Transition frequency	f_T	$V_{CB} = 10\ \text{V}$, $I_E = -50\ \text{mA}$, $f = 200\text{MHz}$		200		MHz

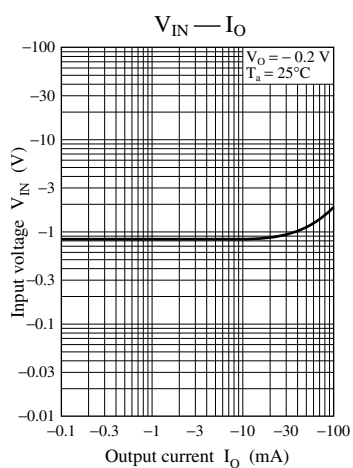
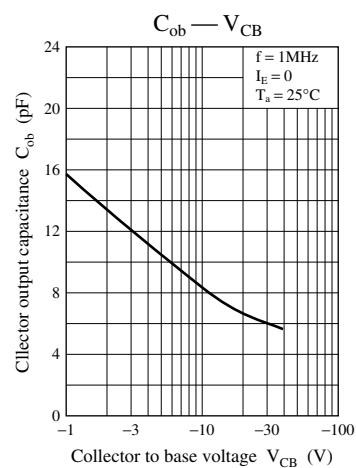
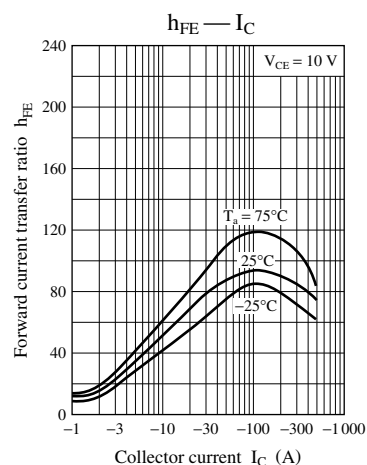
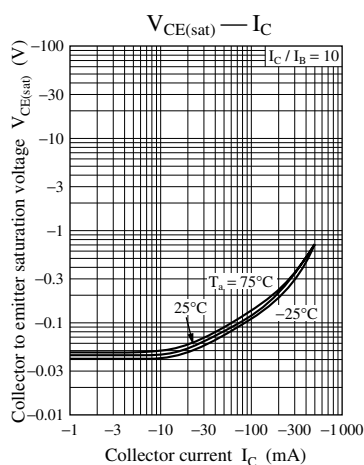
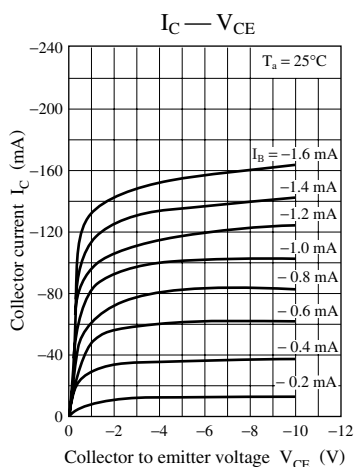
• Tr2

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	μA
	I_{CEO}	$V_{CE} = -50\ \text{V}$, $I_B = 0$			-0.5	μA
Emitter cutoff current	I_{EBO}	$V_{EB} = -6\ \text{V}$, $I_C = 0$			-2.0	mA
Forward current transfer ratio	h_{FE}	$V_{CE} = -10\ \text{V}$, $I_C = -100\ \text{mA}$	20			
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}	$V_{CC} = -5\ \text{V}$, $V_B = -0.5\ \text{V}$, $R_L = 500\ \Omega$	-4.9			V
Low-level output voltage	V_{OL}	$V_{CC} = -5\ \text{V}$, $V_B = -3.5\ \text{V}$, $R_L = 500\ \Omega$			-0.2	V
Input resistance	R_1		-30%	0.27	+30%	k Ω
Resistance ratio	R_1/R_2		0.043	0.054	0.065	
Transition frequency	f_T	$V_{CB} = -10\ \text{V}$, $I_E = 50\ \text{mA}$, $f = 200\text{MHz}$		200		MHz

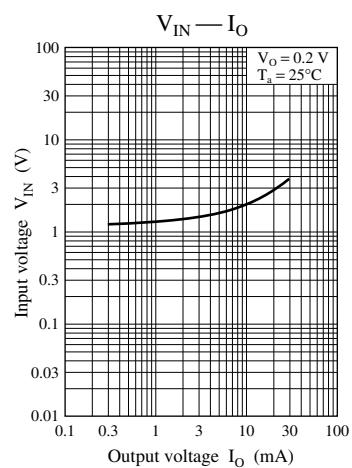
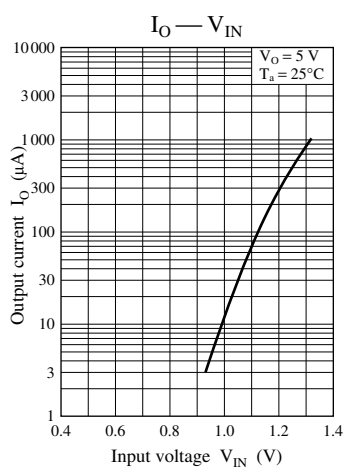
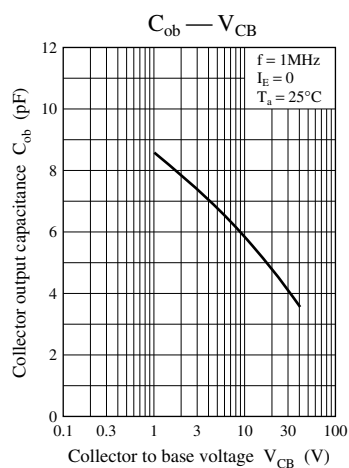
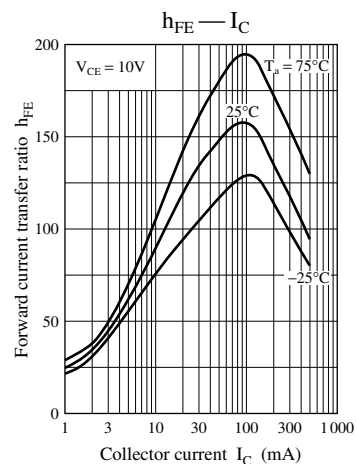
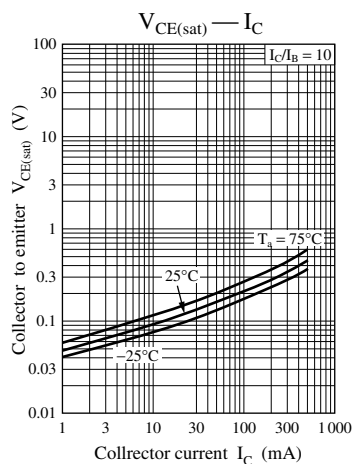
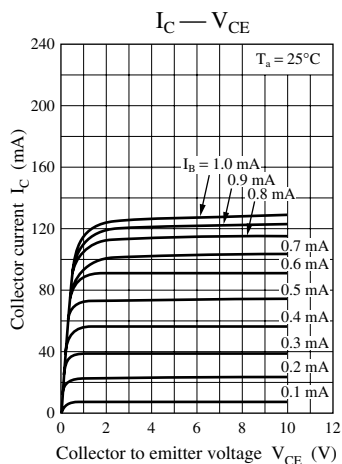
Common characteristics chart



Characteristics chart of Tr1



Characteristics chart of Tr2



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