

# NP0G3D2

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

For digital circuits

## ■ Features

- Two elements incorporated into one package
- Suitable for high density package and downsizing of the equipment
- Automatic insertion with the taping is possible

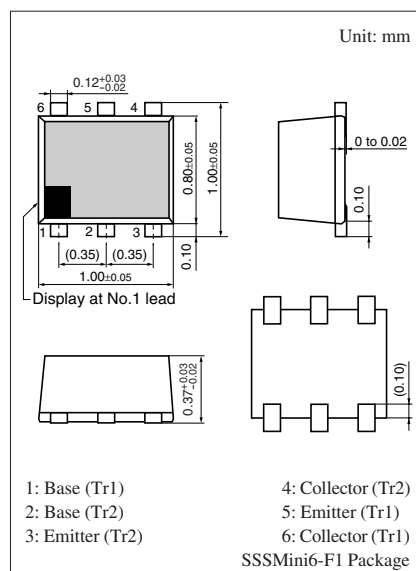
## ■ Basic Part Number of Element

- UNR31AT × UNR32AL

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

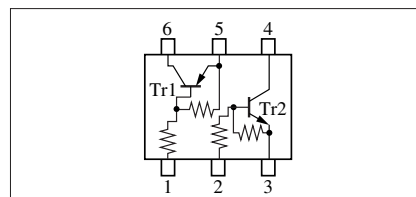
	Parameter	Symbol	Rating	Unit
Tr1	Collector to base voltage	$V_{CBO}$	-50	V
	Collector to emitter voltage	$V_{CEO}$	-50	V
	Collector current	$I_C$	-80	mA
Tr2	Collector to base voltage	$V_{CBO}$	50	V
	Collector to emitter voltage	$V_{CEO}$	50	V
	Collector current	$I_C$	80	mA
Overall	Total power dissipation *	$P_T$	125	mW
	Junction temperature	$T_j$	125	$^\circ\text{C}$
	Storage temperature	$T_{stg}$	-55 to +125	$^\circ\text{C}$

Note) \*: Measuring on substrate at 17 mm × 10 mm × 1 mm



Marking Symbol: 3B

Internal Connection



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

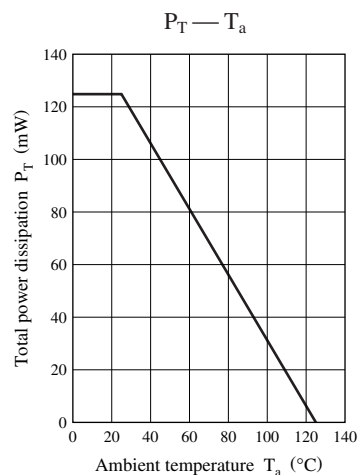
## • Tr1

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector to base voltage	$V_{\text{CBO}}$	$I_{\text{C}} = -10\ \mu\text{A}$ , $I_{\text{E}} = 0$	-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	
Emitter cutoff current	$I_{\text{EBO}}$	$V_{\text{EB}} = -6\ \text{V}$ , $I_{\text{C}} = 0$			-0.2	mA
Forward current transfer ratio	$h_{\text{FE}}$	$V_{\text{CE}} = -10\ \text{V}$ , $I_{\text{C}} = -5\ \text{mA}$	80		400	—
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%	22	+30%	$\text{k}\Omega$
Resistance ratio	$R_{\text{I}} / R_{\text{2}}$			0.47		—
Gain bandwidth product	$f_{\text{T}}$	$V_{\text{CB}} = -10\ \text{V}$ , $I_{\text{E}} = 1\ \text{mA}$ , $f = 200\ \text{MHz}$		80		MHz

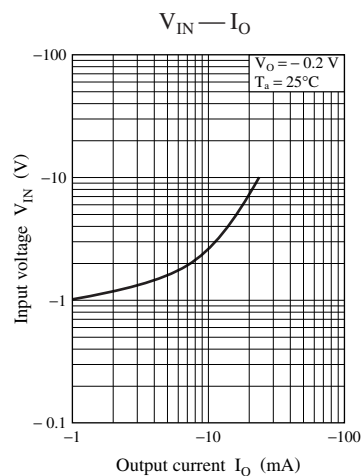
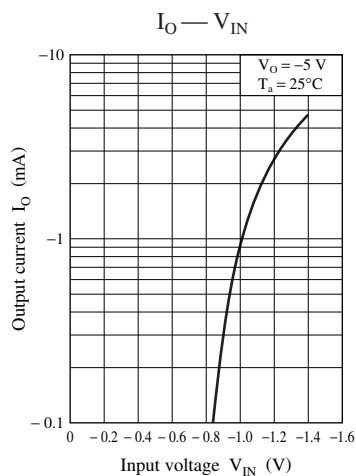
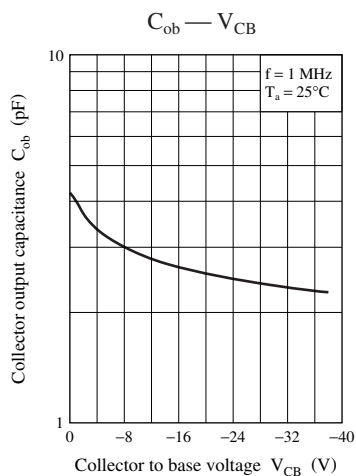
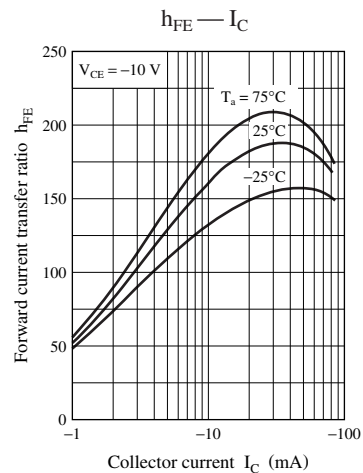
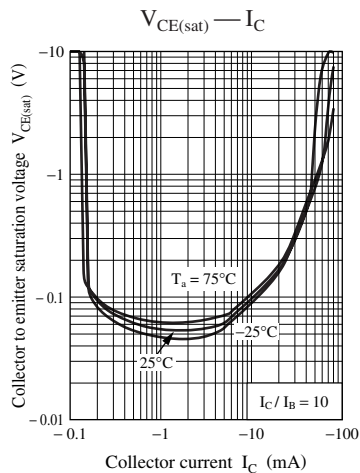
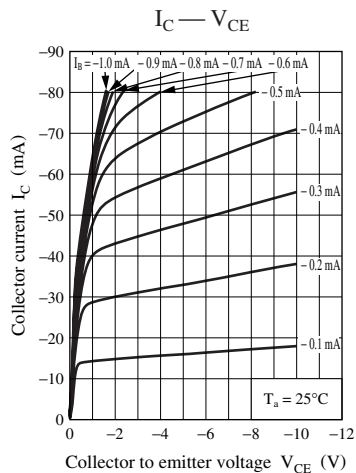
## • Tr2

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	
Emitter cutoff current	$I_{\text{EBO}}$	$V_{\text{EB}} = 6\ \text{V}$ , $I_{\text{C}} = 0$			2.0	mA
Forward current transfer ratio	$h_{\text{FE}}$	$V_{\text{CE}} = 10\ \text{V}$ , $I_{\text{C}} = 5\ \text{mA}$	20			—
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%	$\text{k}\Omega$
Resistance ratio	$R_{\text{I}} / R_{\text{2}}$		0.8	1.0	1.2	—
Gain bandwidth product	$f_{\text{T}}$	$V_{\text{CB}} = 10\ \text{V}$ , $I_{\text{E}} = -2\ \text{mA}$ , $f = 200\ \text{MHz}$		150		MHz

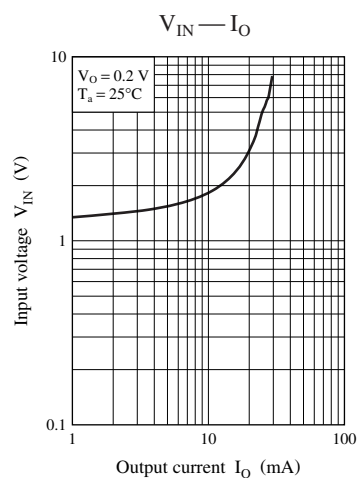
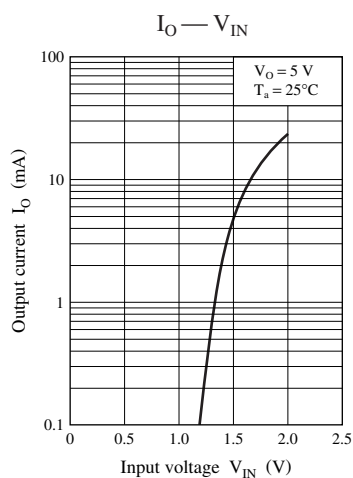
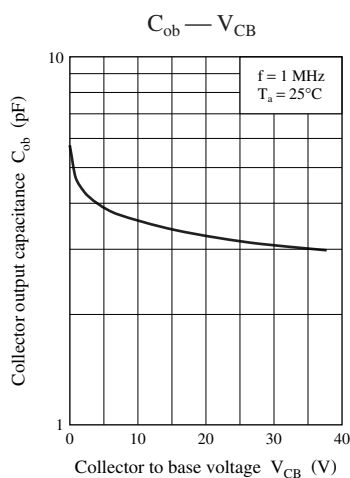
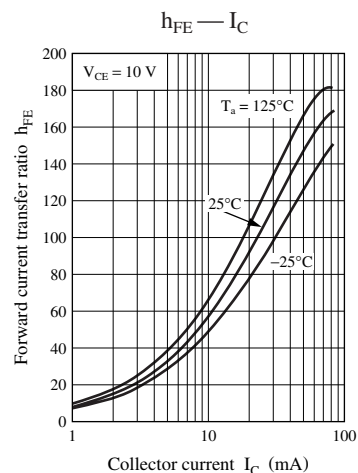
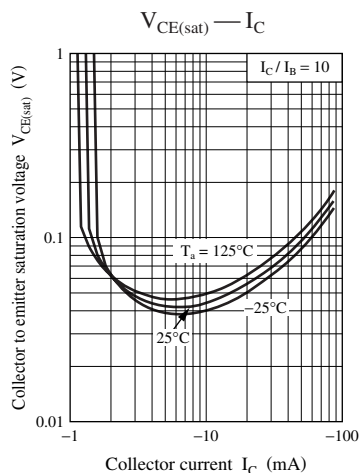
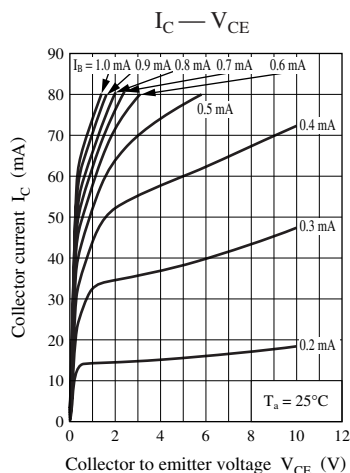
## Common characteristics chart



## Characteristics charts of Tr1



## Characteristics charts of Tr2



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