

NPOG3D3

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

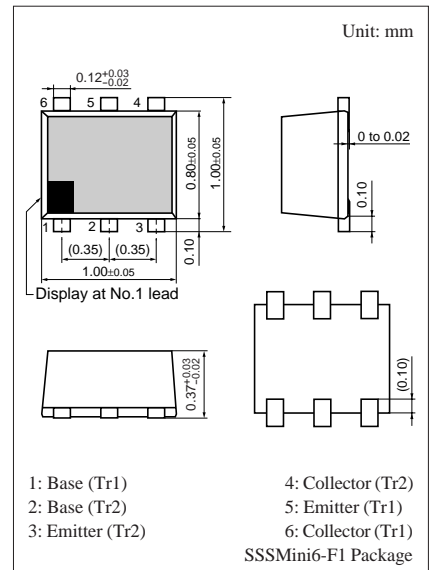
■ Basic Part Number of Element

- UNR31A3 × UNR32AT

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

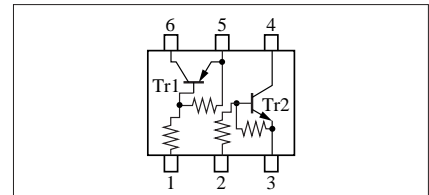
	Parameter	Symbol	Rating	Unit
Tr1	Collector to base voltage	V_{CBO}	-50	V
	Collector to emitter voltage	V_{CEO}	-50	V
	Collector current	I_C	-80	mA
Tr2	Collector to base voltage	V_{CBO}	50	V
	Collector to emitter voltage	V_{CEO}	50	V
	Collector current	I_C	80	mA
Overall	Total power dissipation *	P_T	125	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: 3H

Internal Connection



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

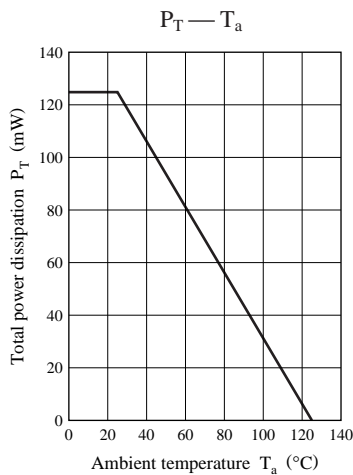
• Tr1

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector to base voltage	V_{CBO}	$I_{\text{C}} = -10 \mu\text{A}, I_{\text{E}} = 0$	-50			V
Collector to emitter voltage	V_{CEO}	$I_{\text{C}} = -2 \text{mA}, I_{\text{B}} = 0$	-50			V
Collector cutoff current	I_{CBO}	$V_{\text{CB}} = -50 \text{V}, I_{\text{E}} = 0$			-0.1	μA
	I_{CEO}	$V_{\text{CE}} = -50 \text{V}, I_{\text{B}} = 0$			-0.5	
Emitter cutoff current	I_{EBO}	$V_{\text{EB}} = -6 \text{V}, I_{\text{C}} = 0$			-0.1	mA
Forward current transfer ratio	h_{FE}	$V_{\text{CE}} = -10 \text{V}, I_{\text{C}} = -5 \text{mA}$	80			—
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_{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_{OL}	$V_{\text{CC}} = -5 \text{V}, V_{\text{B}} = -3.5 \text{V}, R_{\text{L}} = 1 \text{k}\Omega$			-0.2	V
Input resistance	R_{I}		-30%	47	+30%	$\text{k}\Omega$
Resistance ratio	$R_{\text{I}} / R_{\text{2}}$		0.8	1.0	1.2	—
Gain bandwidth product	f_{T}	$V_{\text{CB}} = -10 \text{V}, I_{\text{E}} = 1 \text{mA}, f = 200 \text{MHz}$		80		MHz

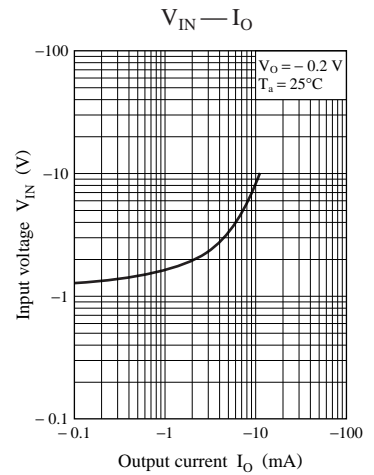
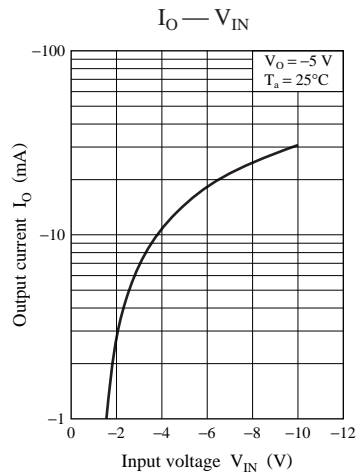
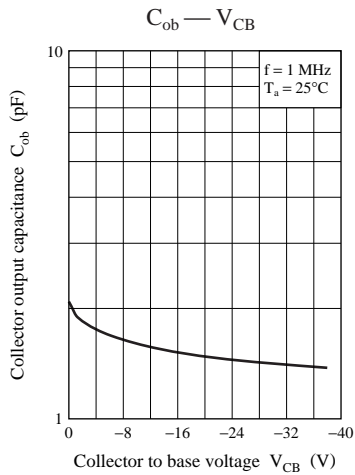
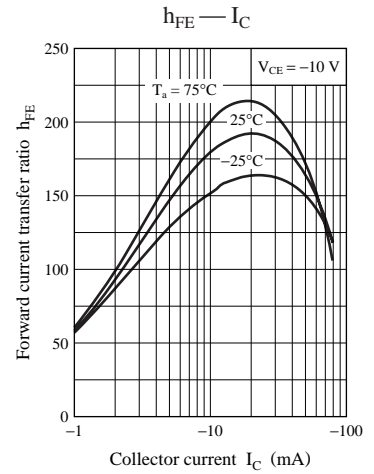
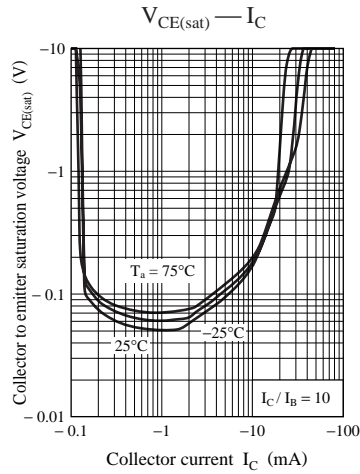
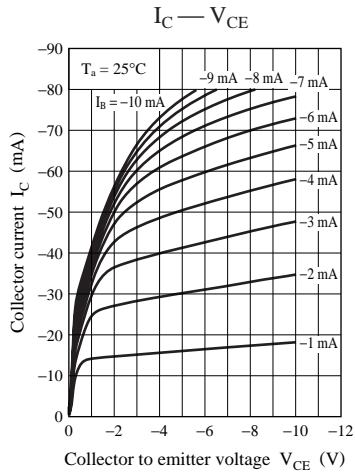
• Tr2

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector to base voltage	V_{CBO}	$I_{\text{C}} = 10 \mu\text{A}, I_{\text{E}} = 0$	50			V
Collector to emitter voltage	V_{CEO}	$I_{\text{C}} = 2 \text{mA}, I_{\text{B}} = 0$	50			V
Collector cutoff current	I_{CBO}	$V_{\text{CB}} = 50 \text{V}, I_{\text{E}} = 0$			0.1	μA
	I_{CEO}	$V_{\text{CE}} = 50 \text{V}, I_{\text{B}} = 0$			0.5	
Emitter cutoff current	I_{EBO}	$V_{\text{EB}} = 6 \text{V}, I_{\text{C}} = 0$			0.2	mA
Forward current transfer ratio	h_{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_{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_{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_{I}		-30%	22	+30%	$\text{k}\Omega$
Resistance ratio	$R_{\text{I}} / R_{\text{2}}$			0.47		—
Gain bandwidth product	f_{T}	$V_{\text{CB}} = 10 \text{V}, I_{\text{E}} = -2 \text{mA}, f = 200 \text{MHz}$		150		MHz

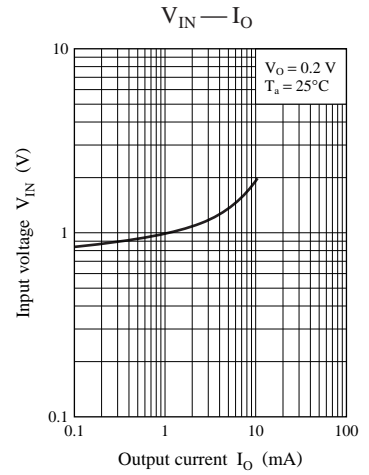
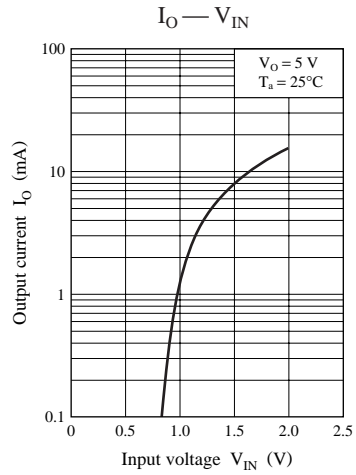
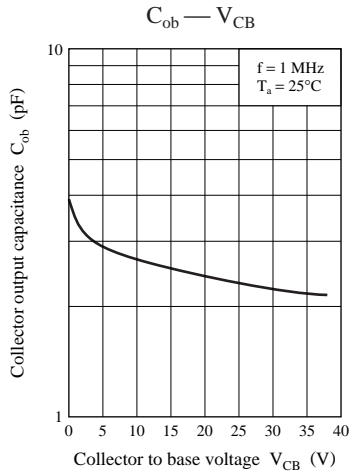
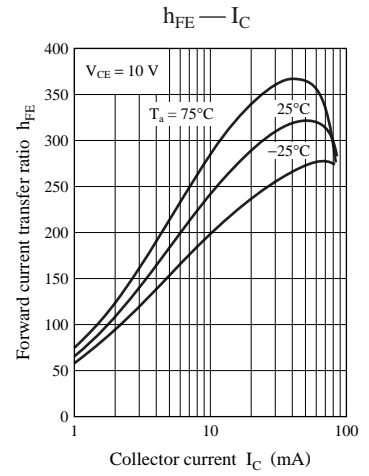
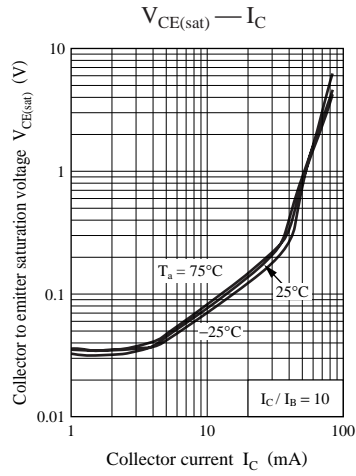
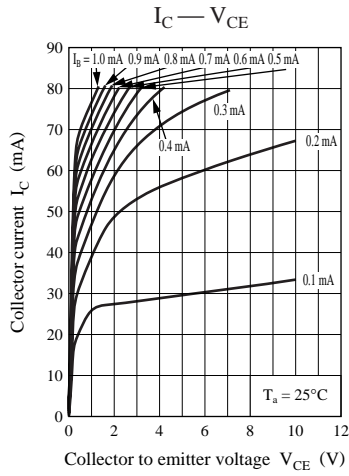
Common characteristics chart



Characteristics charts of Tr1



Characteristics charts of Tr2



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