

# NPOG3D1

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

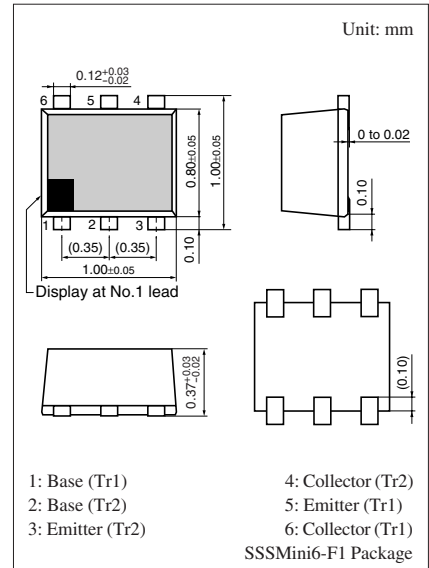
■ Basic Part Number of Element

- UNR31A3 × UNR32AL

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

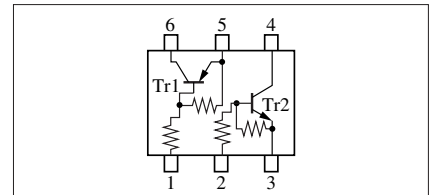
	Parameter	Symbol	Rating	Unit
Tr1	Collector to base voltage	$V_{CBO}$	-50	V
	Collector to emitter voltage	$V_{CEO}$	-50	V
	Collector current	$I_C$	-80	mA
Tr2	Collector to base voltage	$V_{CBO}$	50	V
	Collector to emitter voltage	$V_{CEO}$	50	V
	Collector current	$I_C$	80	mA
Overall	Total power dissipation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

Internal Connection



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

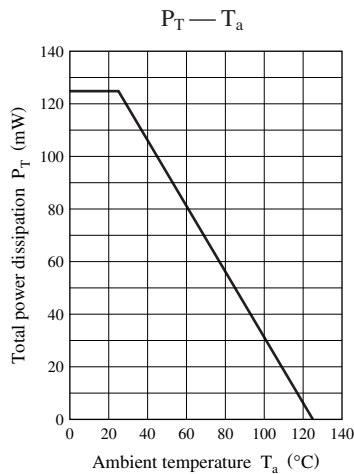
#### • Tr1

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector to base voltage	$V_{CBO}$	$I_C = -10 \mu\text{A}$ , $I_E = 0$	-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	$I_{EBO}$	$V_{EB} = -6 \text{ V}$ , $I_C = 0$			-0.1	mA
Forward current transfer ratio	$h_{FE}$	$V_{CE} = -10 \text{ V}$ , $I_C = -5 \text{ mA}$	80			—
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	$V_{OL}$	$V_{CC} = -5 \text{ V}$ , $V_B = -3.5 \text{ V}$ , $R_L = 1 \text{ k}\Omega$			-0.2	V
Input resistance	$R_1$		-30%	47	+30%	$\text{k}\Omega$
Resistance ratio	$R_1 / R_2$		0.8	1.0	1.2	—
Gain bandwidth product	$f_T$	$V_{CB} = -10 \text{ V}$ , $I_E = 1 \text{ mA}$ , $f = 200 \text{ MHz}$		80		MHz

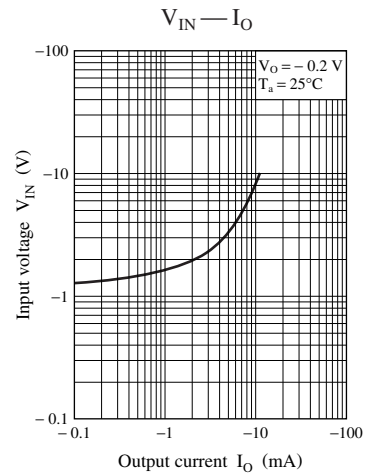
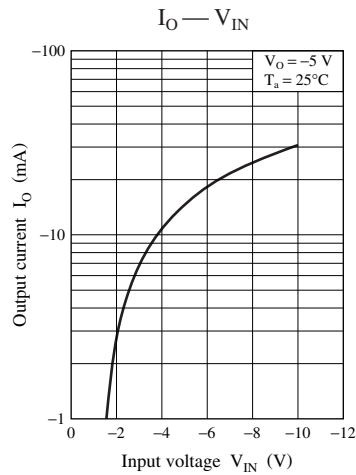
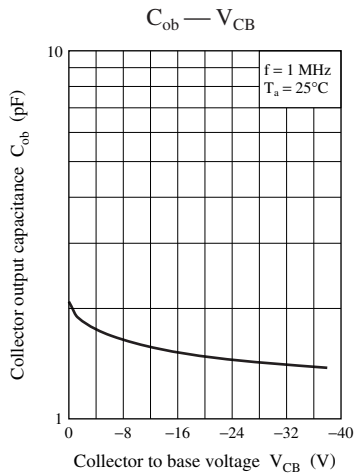
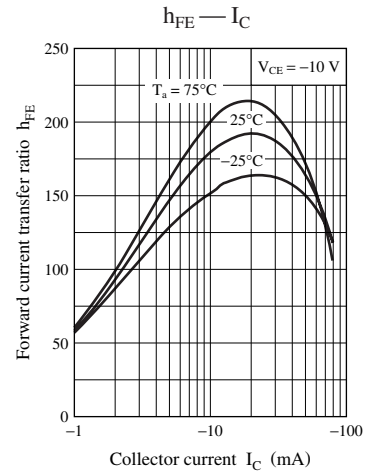
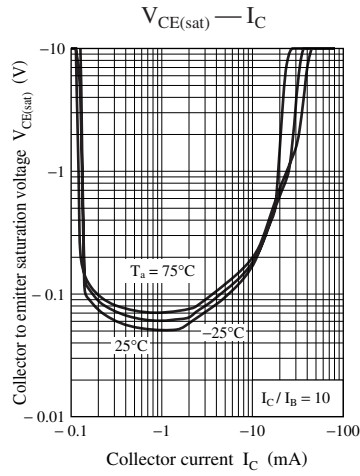
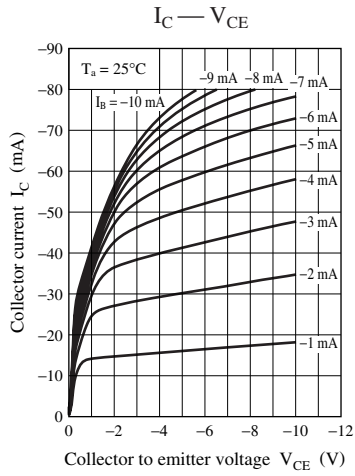
#### • Tr2

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector to base voltage	$V_{CBO}$	$I_C = 10 \mu\text{A}$ , $I_E = 0$	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	$I_{EBO}$	$V_{EB} = 6 \text{ V}$ , $I_C = 0$			2.0	mA
Forward current transfer ratio	$h_{FE}$	$V_{CE} = 10 \text{ V}$ , $I_C = 5 \text{ mA}$	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	$V_{OH}$	$V_{CC} = 5 \text{ V}$ , $V_B = 0.5 \text{ V}$ , $R_L = 1 \text{ k}\Omega$	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	$R_1$		-30%	4.7	+30%	$\text{k}\Omega$
Resistance ratio	$R_1 / R_2$		0.8	1.0	1.2	—
Gain bandwidth product	$f_T$	$V_{CB} = 10 \text{ V}$ , $I_E = -2 \text{ mA}$ , $f = 200 \text{ MHz}$		150		MHz

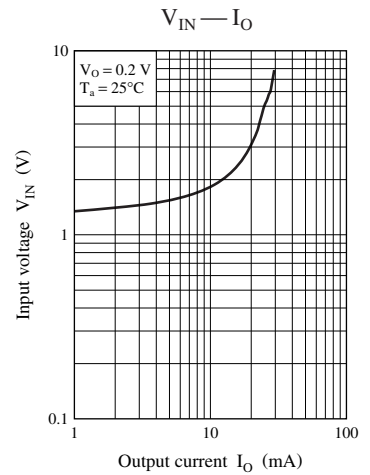
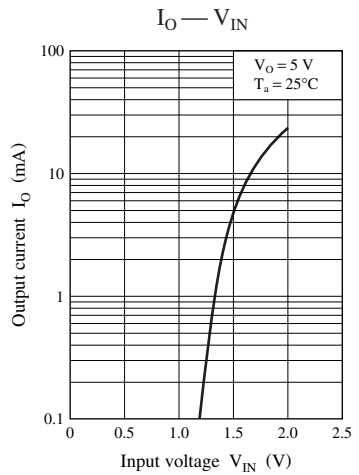
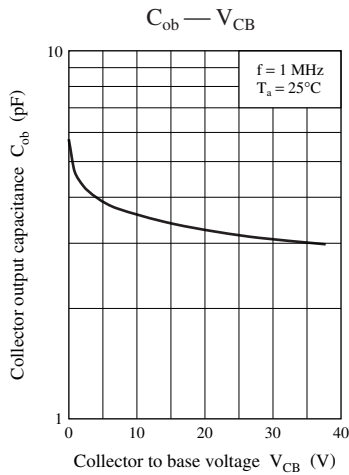
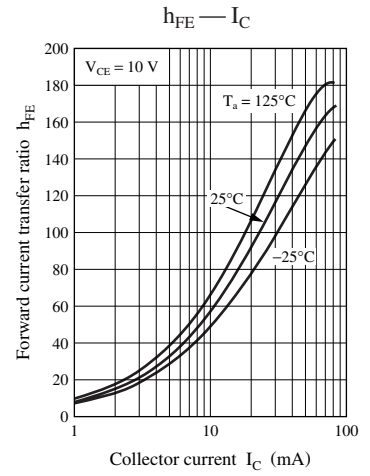
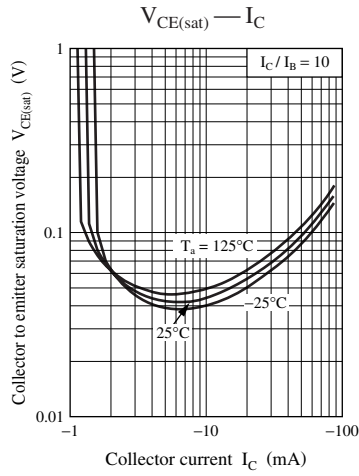
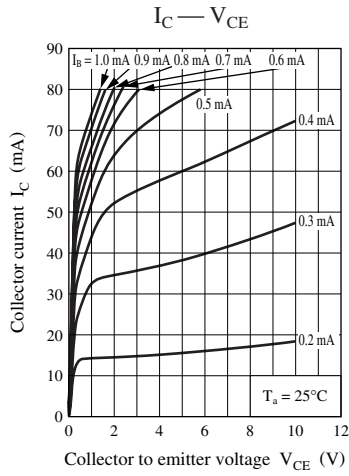
#### Common characteristics chart



Characteristics charts of Tr1



Characteristics charts of Tr2



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