

# XN07651 (XN7651)

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

For motor drive

■ Features

- Two elements incorporated into one package
- Reduction of the mounting area and assembly cost by one half

■ Basic Part Number of Element

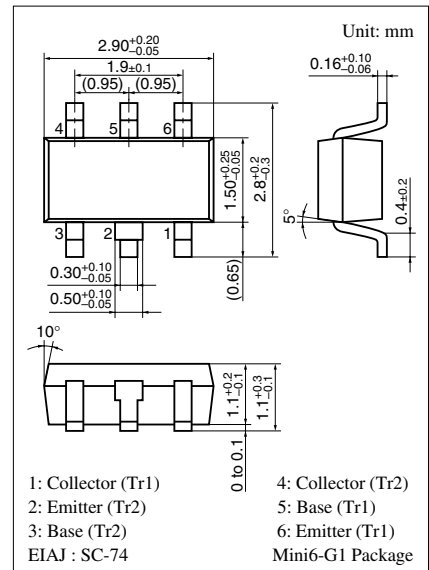
- 2SB0970 (2SB970) + ARN-5

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

	Parameter	Symbol	Rating	Unit
Tr1	Collector to base voltage	$V_{CBO}$	20	V
	Collector to emitter voltage	$V_{CEO}$	15	V
	Emitter to base voltage	$V_{EBO}$	7	V
	Collector current	$I_C$	0.55	A
	Peak collector current	$I_{CP}$	1.1	A
	Collector current *1	$I_C$	0.7	A
Tr2	Collector to base voltage	$V_{CBO}$	-15	V
	Collector to emitter voltage	$V_{CEO}$	-10	V
	Emitter to base voltage	$V_{EBO}$	-7	V
	Collector current	$I_C$	-0.55	A
	Peak collector current	$I_{CP}$	-1.1	A
	Collector current *1	$I_C$	-0.7	A
Overall	Total power dissipation	$P_T$	350	mW
	Total power dissipation *2	$P_T$	750	mW
	Junction temperature	$T_j$	150	$^\circ\text{C}$
	Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

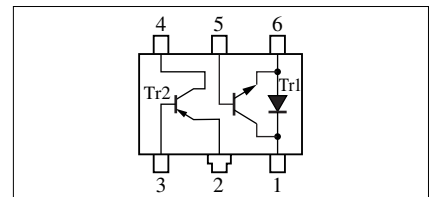
Note) \*1:  $T_a = -20^\circ\text{C} \pm 2^\circ\text{C}$

\*2: An instantaneous total power dissipation (for the single pulse of 50 ms)



Marking Symbol: 9W

Internal Connection



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

■ Electrical characteristics  $T_a = 25^\circ\text{C} \pm 2^\circ\text{C}$

• Tr1

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector to base voltage	$V_{CBO}$	$I_C = 10 \mu\text{A}, I_E = 0$	20			V
Collector to emitter voltage	$V_{CEO}$	$I_C = 1 \text{ mA}, I_B = 0$	15			V
Emitter to base voltage	$V_{EBO}$	$I_E = 10 \mu\text{A}, I_C = 0$	7			V
Collector cutoff current	$I_{CBO}$	$V_{CB} = 15 \text{ V}, I_E = 0$			0.1	$\mu\text{A}$
Forward current transfer ratio	$h_{FE1}^{*1}$	$V_{CE} = 2 \text{ V}, I_C = 0.5 \text{ A}$	200		800	—
	$h_{FE2}^{*1}$	$V_{CE} = 2 \text{ V}, I_C = 1 \text{ A}$	60			—
Collector to emitter saturation voltage	$V_{CE(sat)1}^{*1}$	$I_C = 0.3 \text{ A}, I_B = 8 \text{ mA}$			0.2	V
	$V_{CE(sat)2}^{*1}$	$I_C = 0.7 \text{ A}, I_B = 8 \text{ mA}$			0.5	V
Diode forward voltage	$V_F^{*2}$	$I_F = 0.55 \text{ A}$			1.4	V
Transition frequency	$f_T$	$V_{CB} = 10 \text{ V}, I_E = -50 \text{ mA}, f = 200 \text{ MHz}$		200		MHz
Collector output capacitance	$C_{ob}$	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$		10		pF

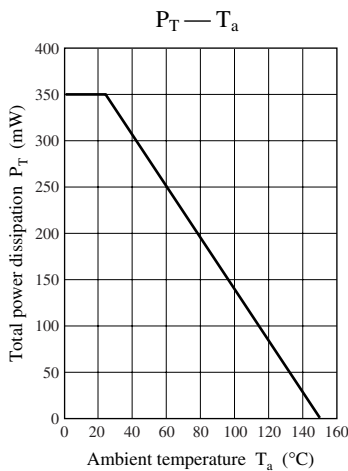
• Tr2

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector to base voltage	$V_{CBO}$	$I_C = -10 \mu\text{A}, I_E = 0$	-15			V
Collector to emitter voltage	$V_{CEO}$	$I_C = -1 \text{ mA}, I_B = 0$	-10			V
Emitter to base voltage	$V_{EBO}$	$I_E = -10 \mu\text{A}, I_C = 0$	-7			V
Collector cutoff current	$I_{CBO}$	$V_{CB} = -10 \text{ V}, I_E = 0$			-0.1	$\mu\text{A}$
Forward current transfer ratio	$h_{FE1}^{*1}$	$V_{CE} = -2 \text{ V}, I_C = -0.5 \text{ A}$	100		350	—
	$h_{FE2}^{*1}$	$V_{CE} = -2 \text{ V}, I_C = -1 \text{ A}$	60			—
Collector to emitter saturation voltage	$V_{CE(sat)1}^{*1}$	$I_C = -0.3 \text{ A}, I_B = -8 \text{ mA}$			-0.22	V
	$V_{CE(sat)2}^{*1}$	$I_C = -0.7 \text{ A}, I_B = -8 \text{ mA}$			-0.6	V
Transition frequency	$f_T$	$V_{CB} = -10 \text{ V}, I_E = 50 \text{ mA}, f = 200 \text{ MHz}$		130		MHz
Collector output capacitance	$C_{ob}$	$V_{CB} = -10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$		22		pF

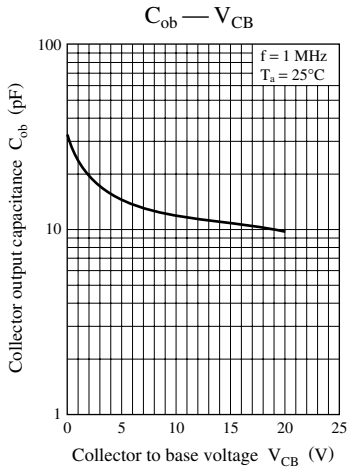
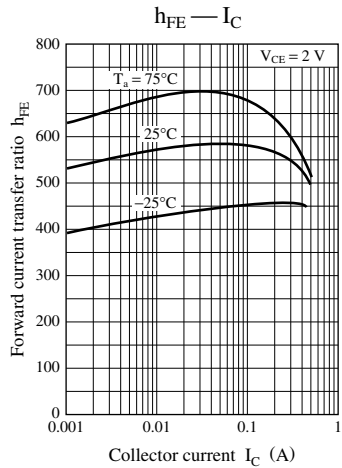
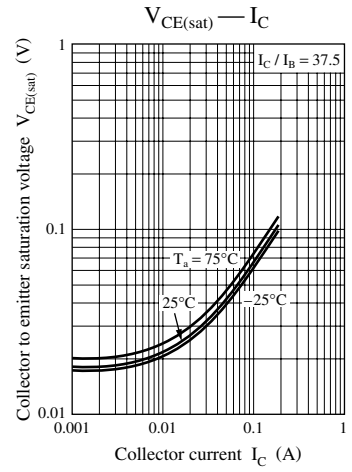
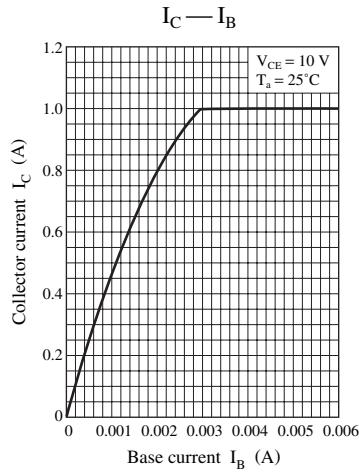
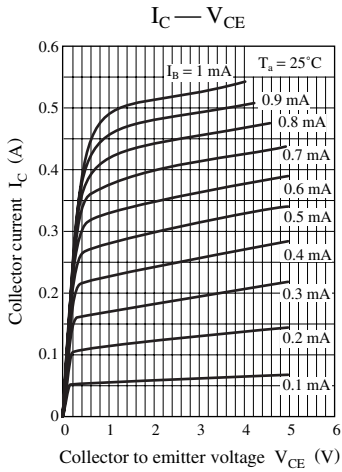
Note) \*1: Pulse measurement

\*2: Effective for the transistor with a built-in diode

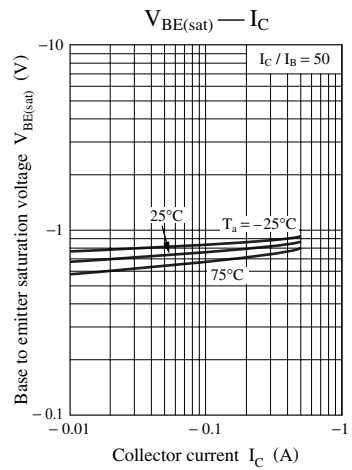
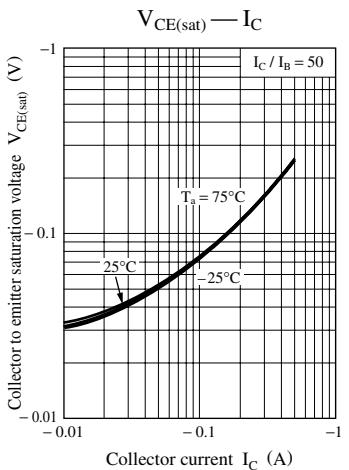
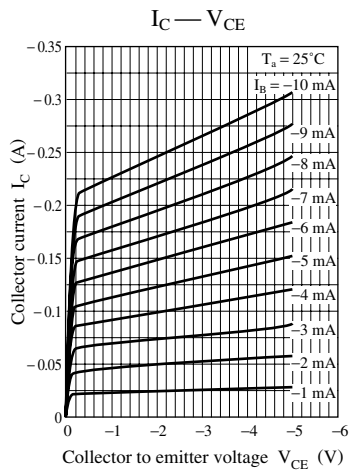
Common characteristics chart

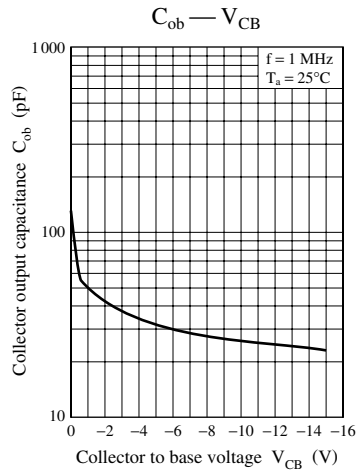
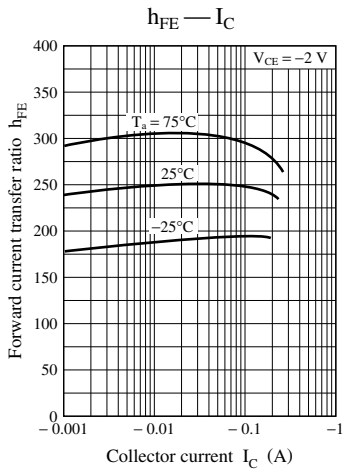


Characteristics charts of Tr1



Characteristics charts of Tr2





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