XP03312

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

For switching/digital circuits

Features

- Two elements incorporated into one package.
  (Transistors with built-in resistor, Tr1 collecter is connected to Tr2 base.)
- Reduction of the mounting area and assembly cost by one half.

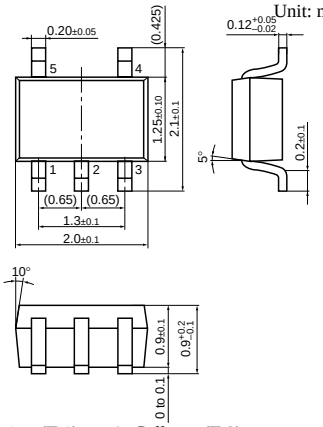
Basic Part Number of Element

- UNR1212(UN1212)+UNR1112(UN1112)

Absolute Maximum Ratings (Ta=25˚C)

Parameter		Symbol	Ratings	Unit
Tr1	Collector to base voltage	V_{CBO}	50	V
	Collector to emitter voltage	V_{CEO}	50	V
	Collector current	I_C	100	mA
Tr2	Collector to base voltage	V_{CBO}	–50	V
	Collector to emitter voltage	V_{CEO}	–50	V
	Collector current	I_C	–100	mA
Overall	Total power dissipation	P_T	150	mW
	Junction temperature	T_j	150	˚C
	Storage temperature	T_{stg}	–55 to +150	˚C

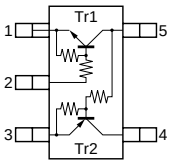
Unit: mm



1 : Emitter(Tr1)
2 : Base(Tr1)
3 : Emitter(Tr2)
4 : Collector(Tr2)
5 : Collector(Tr1)
Base(Tr2)
EIAJ : SC–88A
SMini5-G1 Package

Marking Symbol: 4P

Internal Connection



Note) The Part number in the Parenthesis shows conventional part number.

Electrical Characteristics (Ta=25˚C)

- Tr1

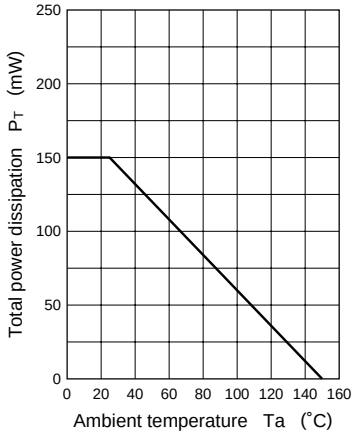
Parameter	Symbol	Conditions	min	typ	max	Unit
Collector to base voltage	V_{CBO}	I_C = 10μA, I_E = 0	50			V
Collector to emitter voltage	V_{CEO}	I_C = 2mA, I_B = 0	50			V
Collector cutoff current	I_{CBO}	V_{CB} = 50V, I_E = 0			0.1	μA
	I_{CEO}	V_{CE} = 50V, I_B = 0			0.5	μA
Emitter cutoff current	I_{EBO}	V_{EB} = 6V, I_C = 0			0.2	mA
Forward current transfer ratio	h_{FE}	V_{CE} = 10V, I_C = 5mA	60			
Collector to emitter saturation voltage	$V_{CE(sat)}$	I_C = 10mA, I_B = 0.3mA			0.25	V
Output voltage high level	V_{OH}	V_{CC} = 5V, V_B = 0.5V, R_L = 1kΩ	4.9			V
Output voltage low level	V_{OL}	V_{CC} = 5V, V_B = 2.5V, R_L = 1kΩ			0.2	V
Input resistance	R_1		–30%	22	+30%	kΩ
Resistance ratio	R_1/R_2		0.8	1.0	1.2	
Transition frequency	f_T	V_{CB} = 10V, I_E = –1mA, f = 200MHz		150		MHz

- Tr2

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector to base voltage	V_{CBO}	I_C = –10μA, I_E = 0	–50			V
Collector to emitter voltage	V_{CEO}	I_C = –2mA, I_B = 0	–50			V
Collector cutoff current	I_{CBO}	V_{CB} = –50V, I_E = 0			– 0.1	μA
	I_{CEO}	V_{CE} = –50V, I_B = 0			– 0.5	μA
Emitter cutoff current	I_{EBO}	V_{EB} = –6V, I_C = 0			– 0.2	mA
Forward current transfer ratio	h_{FE}	V_{CE} = –10V, I_C = –5mA	60			
Collector to emitter saturation voltage	$V_{CE(sat)}$	I_C = –10mA, I_B = – 0.3mA			– 0.25	V
Output voltage high level	V_{OH}	V_{CC} = –5V, V_B = – 0.5V, R_L = 1kΩ	–4.9			V
Output voltage low level	V_{OL}	V_{CC} = –5V, V_B = –2.5V, R_L = 1kΩ			– 0.2	V
Input resistance	R_1		–30%	22	+30%	kΩ
Resistance ratio	R_1/R_2		0.8	1.0	1.2	
Transition frequency	f_T	V_{CB} = –10V, I_E = 1mA, f = 200MHz		80		MHz

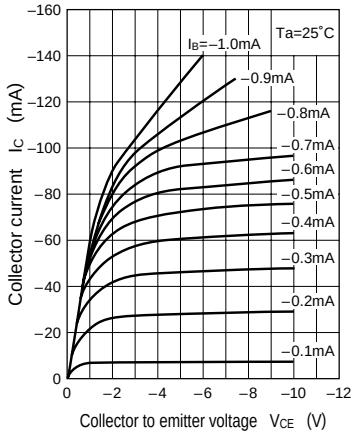
Common characteristics chart

P_T — Ta

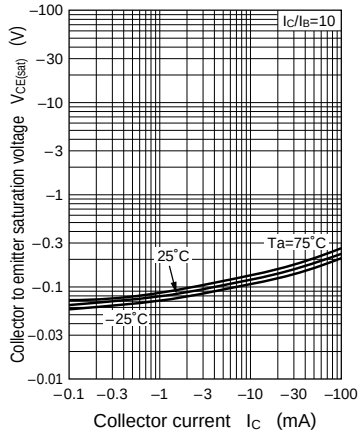


Characteristics charts of Tr1

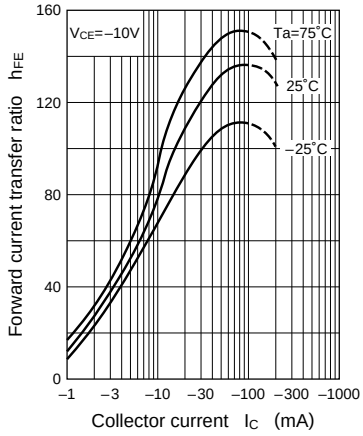
I_C — V_{CE}



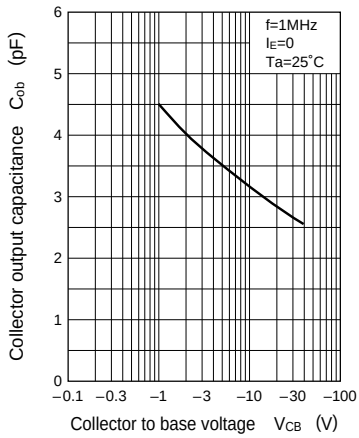
$V_{CE(sat)}$ — I_C



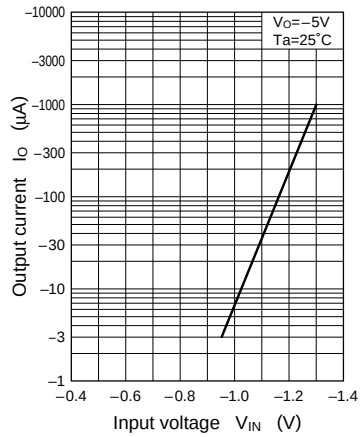
h_{FE} — I_C



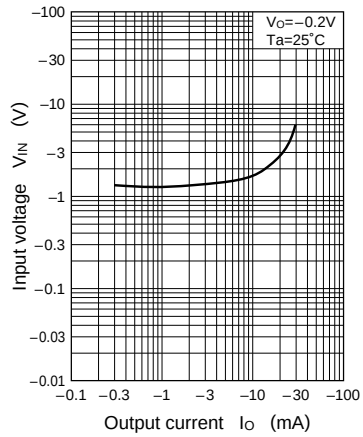
C_{ob} — V_{CB}



I_O — V_{IN}

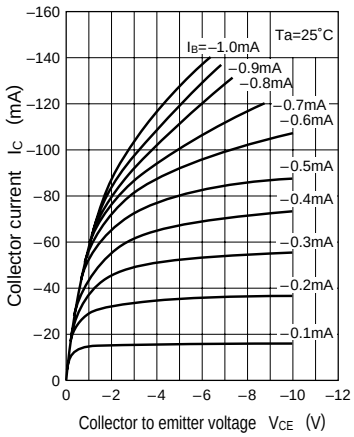


V_{IN} — I_O

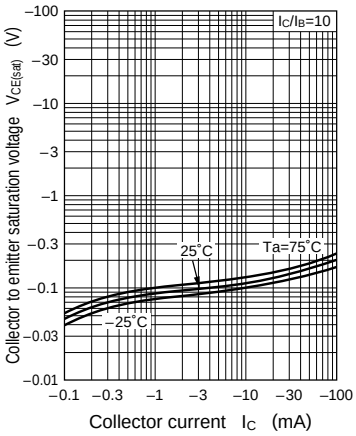


Characteristics charts of Tr2

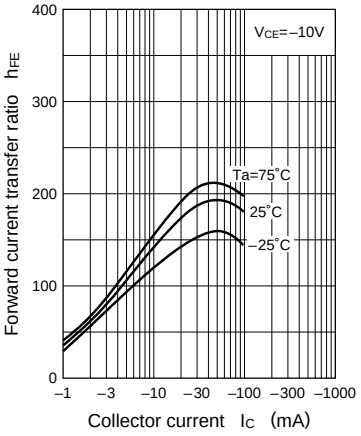
I_C — V_{CE}



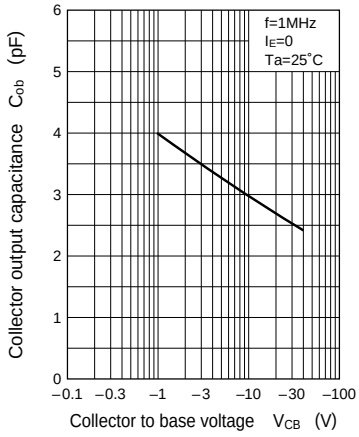
$V_{CE(sat)}$ — I_C



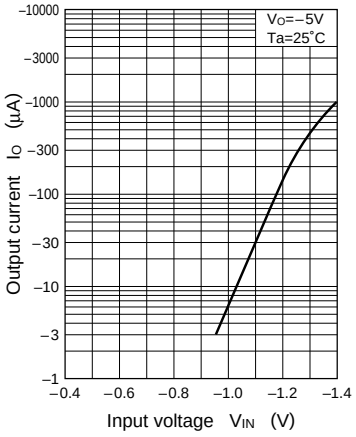
h_{FE} — I_C



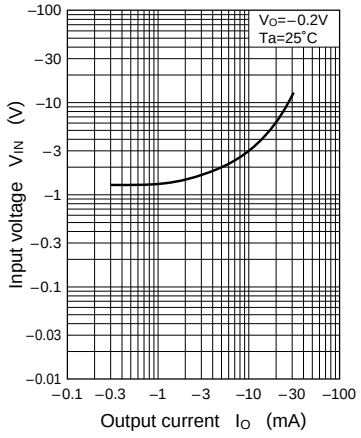
C_{ob} — V_{CB}



I_O — V_{IN}



V_{IN} — I_O



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