

XP03311

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

For switching/digital circuits

Features

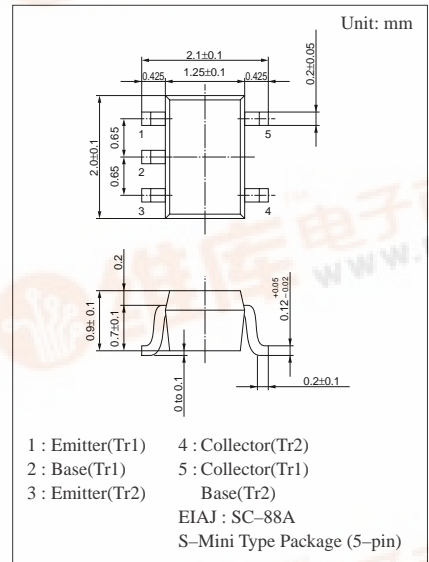
- Two elements incorporated into one package.
(Transistors with built-in resistor, Tr1 collector is connected to Tr2 base.)
- Reduction of the mounting area and assembly cost by one half.

Basic Part Number of Element

- UN1211+UN1111

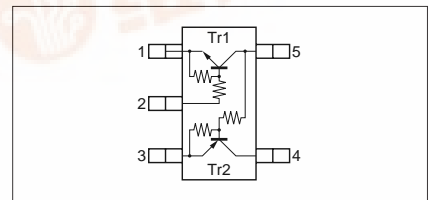
Absolute Maximum Ratings (Ta=25°C)

	Parameter	Symbol	Rated	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



Marking Symbol: DU

Internal Connection



■ Electrical Characteristics (Ta=25°C)

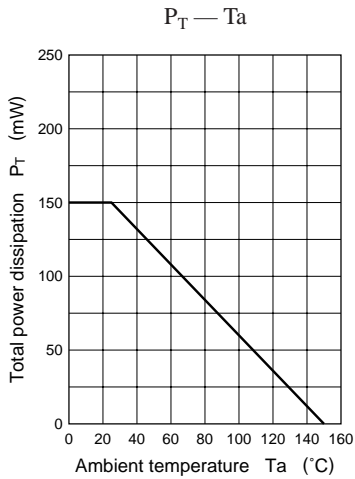
● Tr1

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector to base voltage	V_{CBO}	$I_C = 10\mu A, I_E = 0$	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}	$V_{EB} = 6V, I_C = 0$			0.5	mA
Forward current transfer ratio	h_{FE}	$V_{CE} = 10V, I_C = 5mA$	35			
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = 10mA, I_B = 0.3mA$			0.25	V
Output voltage high level	V_{OH}	$V_{CC} = 5V, V_B = 0.5V, R_L = 1k\Omega$	4.9			V
Output voltage low level	V_{OL}	$V_{CC} = 5V, V_B = 2.5V, R_L = 1k\Omega$			0.2	V
Input resistance	R_1		-30%	10	+30%	$k\Omega$
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

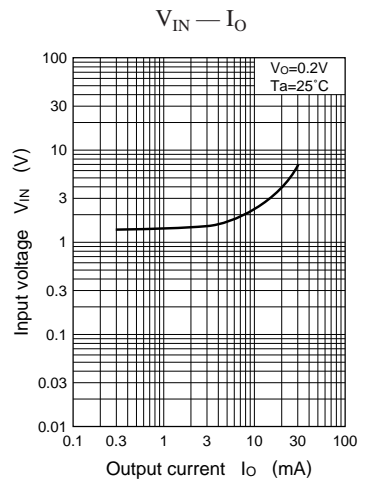
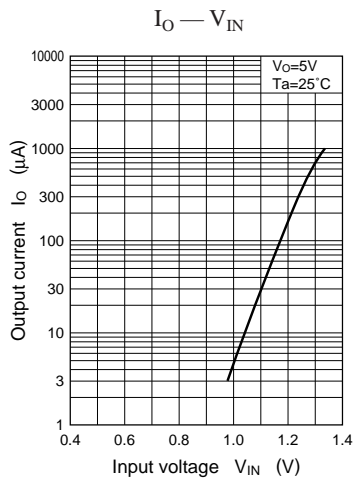
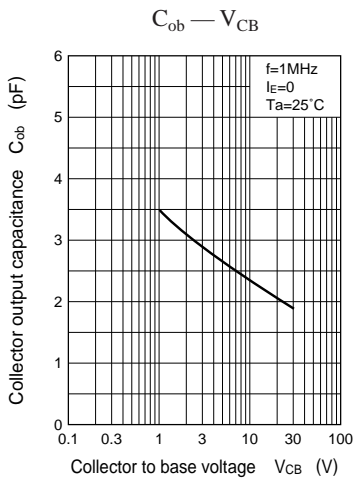
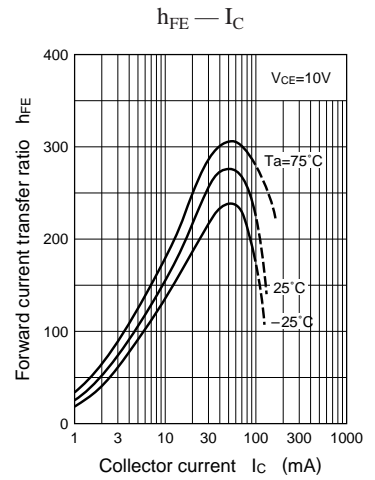
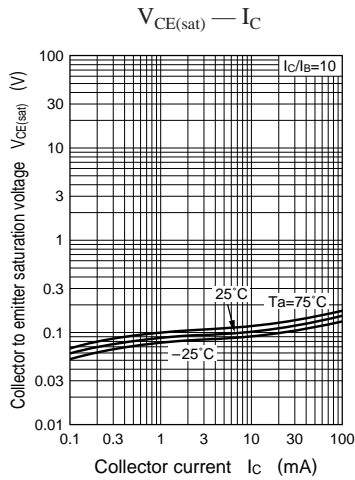
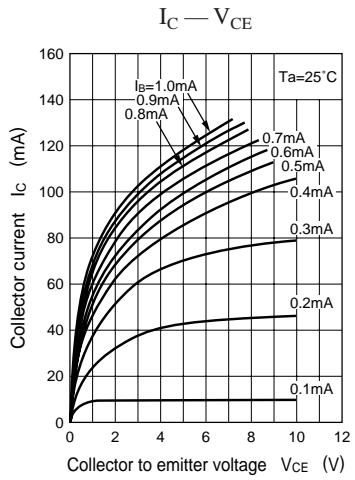
● Tr2

Parameter	Symbol	Conditions	min	typ	max	Unit
Collector to base voltage	V_{CBO}	$I_C = -10\mu A, I_E = 0$	-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}	$V_{EB} = -6V, I_C = 0$			-0.5	mA
Forward current transfer ratio	h_{FE}	$V_{CE} = -10V, I_C = -5mA$	35			
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_C = -10mA, I_B = -0.3mA$			-0.25	V
Output voltage high level	V_{OH}	$V_{CC} = -5V, V_B = -0.5V, R_L = 1k\Omega$	-4.9			V
Output voltage low level	V_{OL}	$V_{CC} = -5V, V_B = -2.5V, R_L = 1k\Omega$			-0.2	V
Input resistance	R_1		-30%	10	+30%	$k\Omega$
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

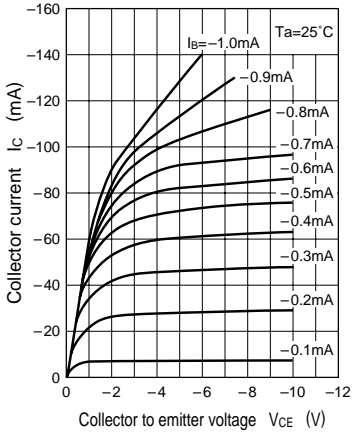


Characteristics charts of Tr1

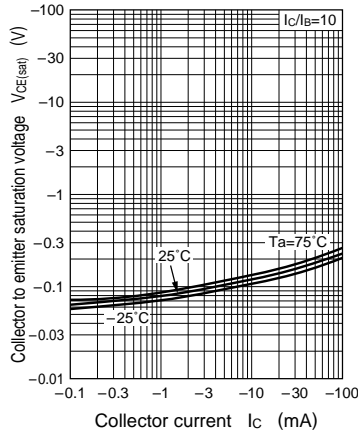


Characteristics charts of Tr2

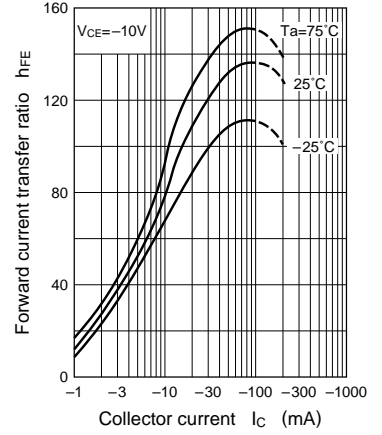
$I_C - V_{CE}$



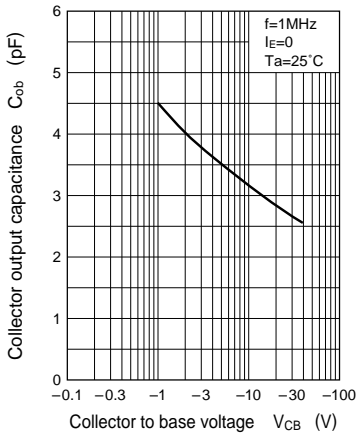
$V_{CE(sat)} - I_C$



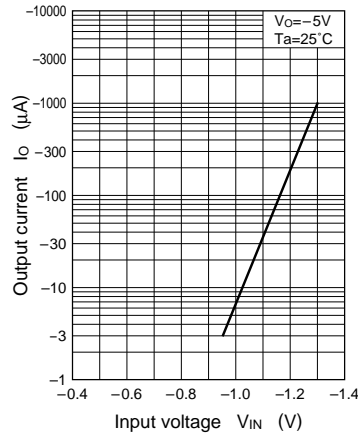
$h_{FE} - I_C$



$C_{ob} - V_{CB}$



$I_O - V_{IN}$



$V_{IN} - I_O$

