

UNA0228 (UN228)

Silicon PNP epitaxial planar type (2 elements)
Silicon NPN epitaxial planar type (2 elements)

For motor drives

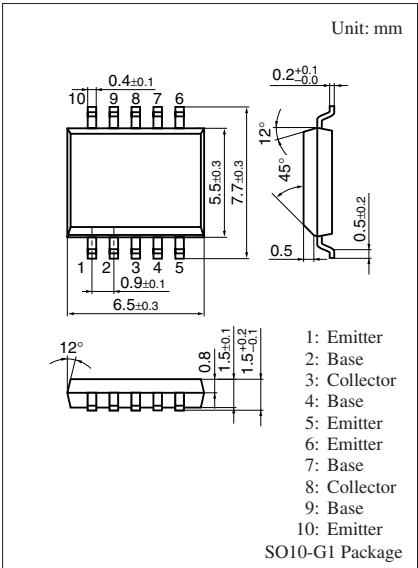
■ Features

- Small and lightweight
- Low power consumption
- Low voltage drive
- With 4 elements incorporated

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

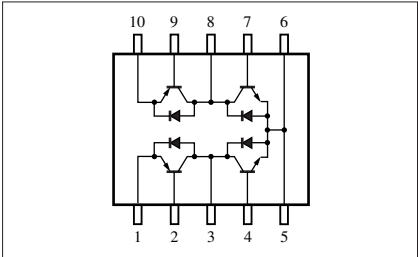
	Parameter	Symbol	Rating	Unit
PNP	Collector-base voltage (Emitter open)	V_{CBO}	-12	V
	Collector-emitter voltage (Base open)	V_{CEO}	-10	V
	Emitter-base voltage (Collector open)	V_{EBO}	-7	V
	Collector current	I_C	-1	A
	Peak collector current	I_{CP}	-2.5	A
NPN	Collector-base voltage (Emitter open)	V_{CBO}	12	V
	Collector-emitter voltage (Base open)	V_{CEO}	10	V
	Emitter-base voltage (Collector open)	V_{EBO}	7	V
	Collector current	I_C	1	A
	Peak collector current	I_{CP}	2.5	A
Overall	Total power dissipation *	P_T	0.5	W
	Junction temperature	T_j	150	$^{\circ}\text{C}$
	Storage temperature	T_{stg}	-55 to +150	$^{\circ}\text{C}$

Note) *: When the dissipation on one device is $T_C = 25^{\circ}\text{C}$



Marking Symbol: UN228

Internal Connection



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

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

• PNP

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)	V_{CBO}	$I_C = -10\ \mu\text{A}$, $I_E = 0$	-12			V
Collector-emitter voltage (Base open)	V_{CEO}	$I_C = -1\ \text{mA}$, $I_B = 0$	-10			V
Emitter-base voltage (Collector open)	V_{EBO}	$I_E = -10\ \mu\text{A}$, $I_C = 0$	-7			V
Collector-base cutoff current (Emitter open)	I_{CBO}	$V_{CB} = -10\ \text{V}$, $I_E = 0$			-1	μA
Forward current transfer ratio *1	h_{FE}	$V_{CE} = -1\ \text{V}$, $I_C = -0.5\ \text{A}$	200		800	—
Collector-emitter saturation voltage *1	$V_{CE(sat)}$	$I_C = -1\ \text{A}$, $I_B = -30\ \text{mA}$		-0.2	-0.3	V
Transition frequency	f_T	$V_{CB} = -6\ \text{V}$, $I_E = 50\ \text{mA}$, $f = 200\ \text{MHz}$		150		MHz
Collector output capacitance (Common base, input open circuited)	C_{ob}	$V_{CB} = -10\ \text{V}$, $I_E = 0$, $f = 1\ \text{MHz}$		65		pF
Forward voltage *2	V_F	$I_F = -1\ \text{A}$			-1.5	V

• NPN

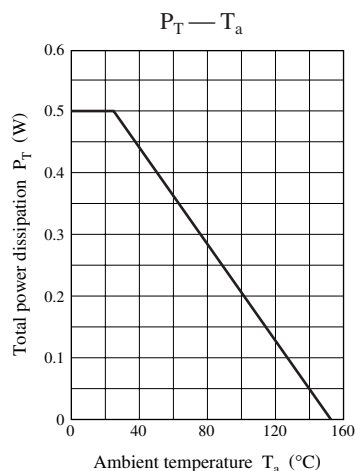
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)	V_{CBO}	$I_C = 10\ \mu\text{A}$, $I_E = 0$	12			V
Collector-emitter voltage (Base open)	V_{CEO}	$I_C = 1\ \text{mA}$, $I_B = 0$	10			V
Emitter-base voltage (Collector open)	V_{EBO}	$I_E = 10\ \mu\text{A}$, $I_C = 0$	7			V
Collector-base cutoff current (Emitter open)	I_{CBO}	$V_{CB} = 10\ \text{V}$, $I_E = 0$			1	μA
Forward current transfer ratio *1	h_{FE}	$V_{CE} = 1\ \text{V}$, $I_C = 0.5\ \text{A}$	200		800	—
Collector-emitter saturation voltage *1	$V_{CE(sat)}$	$I_C = 1\ \text{A}$, $I_B = 30\ \text{mA}$		0.2	0.3	V
Transition frequency	f_T	$V_{CB} = 6\ \text{V}$, $I_E = -50\ \text{mA}$, $f = 200\ \text{MHz}$		150		MHz
Collector output capacitance (Common base, input open circuited)	C_{ob}	$V_{CB} = 10\ \text{V}$, $I_E = 0$, $f = 1\ \text{MHz}$		50		pF
Forward voltage *2	V_F	$I_F = 1\ \text{A}$			1.5	V

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

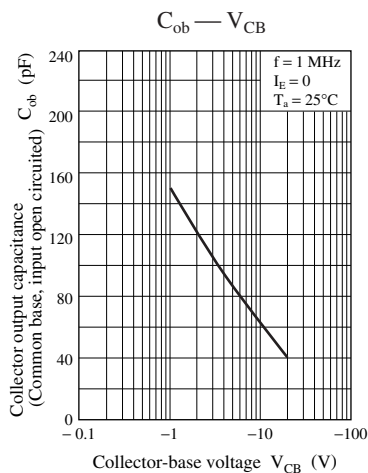
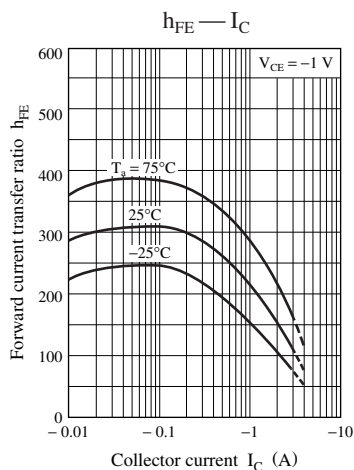
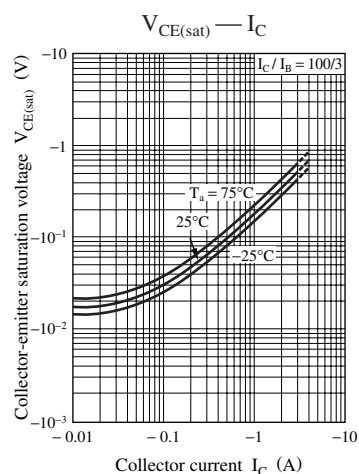
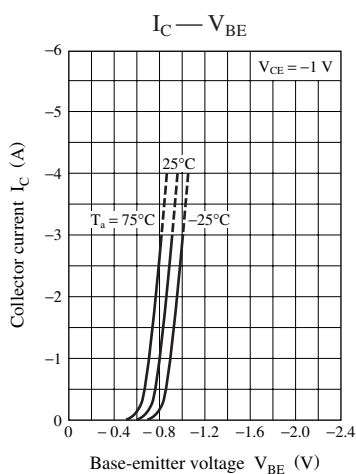
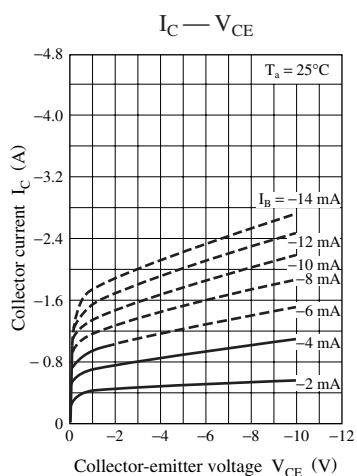
2. *1: Pulse measurement

*2: Application to the built-in diode

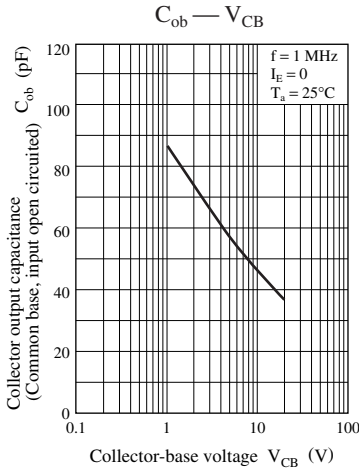
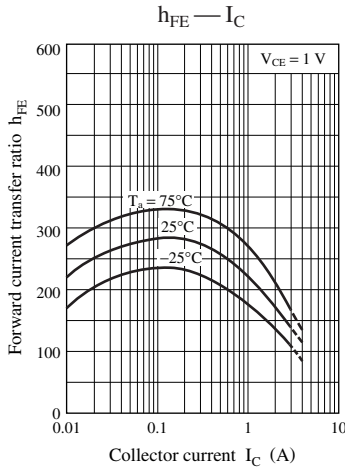
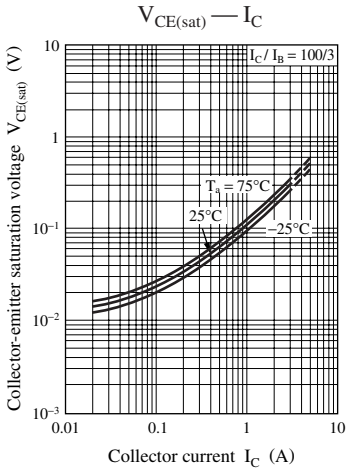
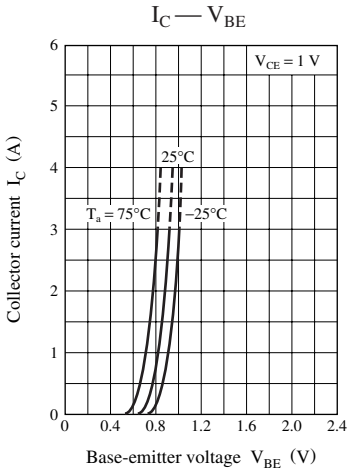
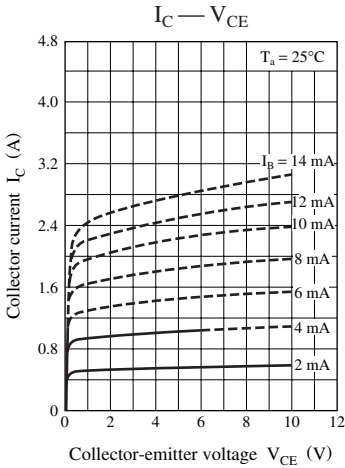
Common characteristics chart



Characteristics charts of PNP transistor block



Characteristics charts of NPN transistor block



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