

UNA0235

Silicon PNP epitaxial planar transistor (3 elements)
 Silicon NPN epitaxial planar transistor (3 elements)

For motor drives

For small motor drive circuits in general

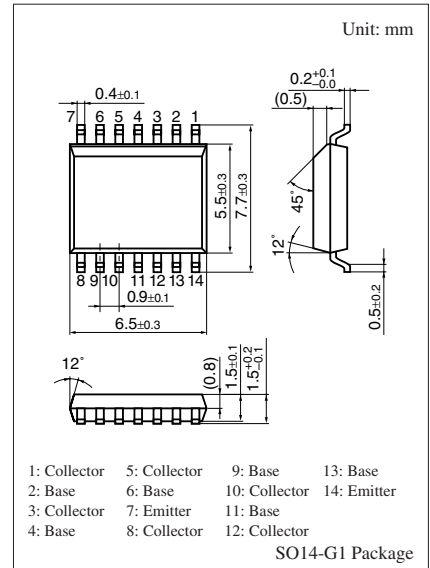
■ Features

- Small and lightweight
- Low power consumption
- Low-voltage drive
- With 6 elements incorporated

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

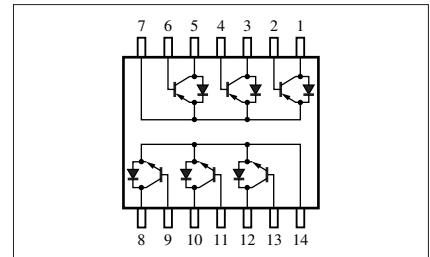
	Parameter	Symbol	Rating	Unit
PNP	Collector-base voltage (Emitter open)	V_{CBO}	-12	V
	Collector-emitter voltage (Base open)	V_{CEO}	-10	V
	Emitter-base voltage (Collector open)	V_{EBO}	-7	V
	Collector current	I_C	-3	A
	Peak collector current	I_{CP}	-4	A
NPN	Collector-base voltage (Emitter open)	V_{CBO}	12	V
	Collector-emitter voltage (Base open)	V_{CEO}	10	V
	Emitter-base voltage (Collector open)	V_{EBO}	7	V
	Collector current	I_C	3	A
	Peak collector current	I_{CP}	4	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: UN235

Internal Connection



■ 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}	$I_{\text{C}} = -10 \mu\text{A}, I_{\text{E}} = 0$	-12			V
Collector-emitter voltage (Base open)	V_{CEO}	$I_{\text{C}} = -1 \text{ mA}, I_{\text{B}} = 0$	-10			V
Emitter-base voltage (Collector open)	V_{EBO}	$I_{\text{E}} = -10 \mu\text{A}, I_{\text{C}} = 0$	-7			V
Collector-base cutoff current (Emitter open)	I_{CBO}	$V_{\text{CB}} = -10 \text{ V}, I_{\text{E}} = 0$			-1	μA
Forward current transfer ratio *1	h_{FE}	$V_{\text{CE}} = -1 \text{ V}, I_{\text{C}} = -0.5 \text{ A}$	200		800	—
Collector-emitter saturation voltage *1	$V_{\text{CE(sat)}}$	$I_{\text{C}} = -2 \text{ A}, I_{\text{B}} = -50 \text{ mA}$			-0.45	V
Transition frequency	f_{T}	$V_{\text{CB}} = -6 \text{ V}, I_{\text{E}} = 50 \text{ mA}, f = 200 \text{ MHz}$		150		MHz
Collector output capacitance (Common base, input open circuited)	C_{ob}	$V_{\text{CB}} = -10 \text{ V}, I_{\text{E}} = 0, f = 1 \text{ MHz}$		65		pF
Forward voltage *2	V_{F}	$I_{\text{F}} = -1 \text{ A}$			-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 internal diode

• NPN

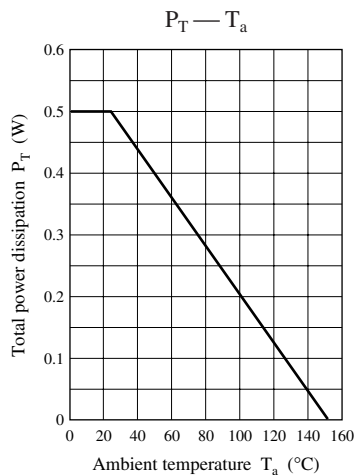
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)	V_{CBO}	$I_{\text{C}} = 10 \mu\text{A}, I_{\text{E}} = 0$	12			V
Collector-emitter voltage (Base open)	V_{CEO}	$I_{\text{C}} = 1 \text{ mA}, I_{\text{B}} = 0$	10			V
Emitter-base voltage (Collector open)	V_{EBO}	$I_{\text{E}} = 10 \mu\text{A}, I_{\text{C}} = 0$	7			V
Collector-base cutoff current (Emitter open)	I_{CBO}	$V_{\text{CB}} = 10 \text{ V}, I_{\text{E}} = 0$			1	μA
Forward current transfer ratio *1	h_{FE}	$V_{\text{CE}} = 1 \text{ V}, I_{\text{C}} = 0.5 \text{ A}$	200		800	—
Collector-emitter saturation voltage *1	$V_{\text{CE(sat)}}$	$I_{\text{C}} = 2 \text{ A}, I_{\text{B}} = 50 \text{ mA}$			0.25	V
Transition frequency	f_{T}	$V_{\text{CB}} = 6 \text{ V}, I_{\text{E}} = -50 \text{ mA}, f = 200 \text{ MHz}$		150		MHz
Collector output capacitance (Common base, input open circuited)	C_{ob}	$V_{\text{CB}} = 10 \text{ V}, I_{\text{E}} = 0, f = 1 \text{ MHz}$		50		pF
Forward voltage *2	V_{F}	$I_{\text{F}} = 1 \text{ A}$			1.5	V

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

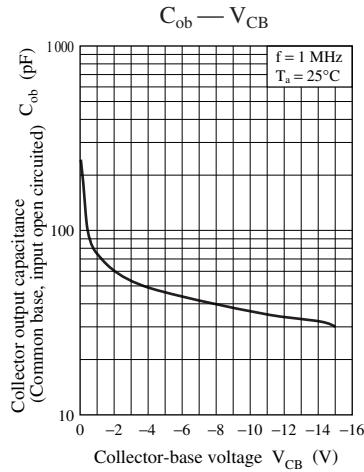
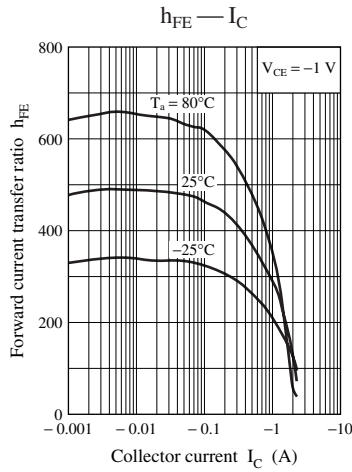
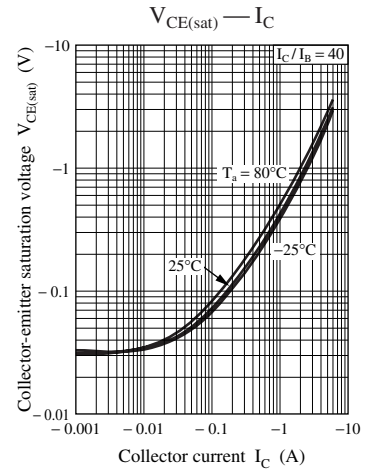
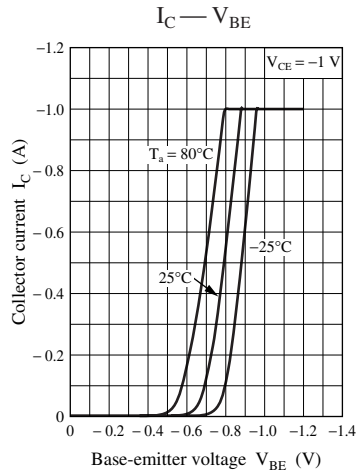
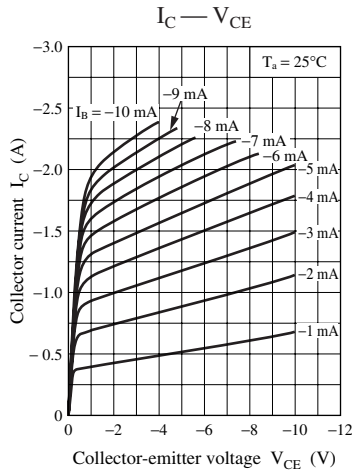
2. *1: Pulse measurement

*2: Application to the internal diode

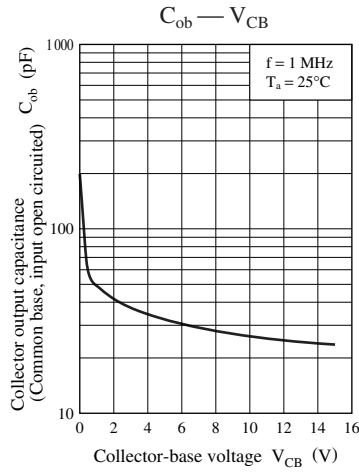
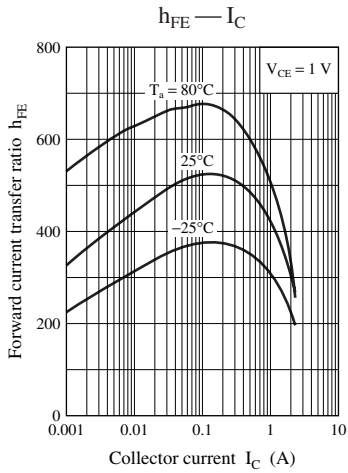
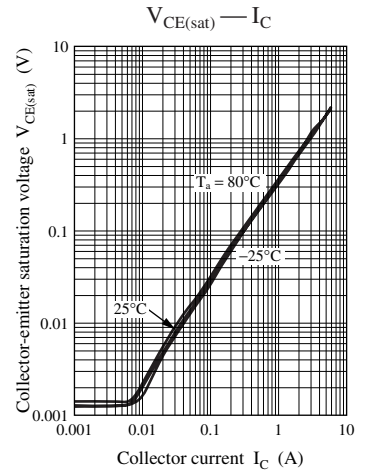
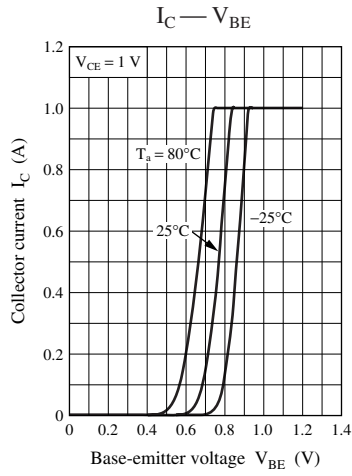
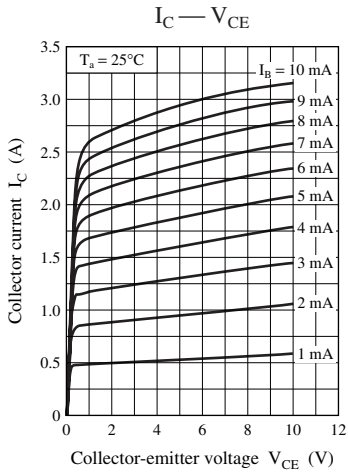
Common characteristics chart



Characteristics charts of PNP transistor block



Characteristics charts of NPN transistor block



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