XP0431M

Silicon NPN epitaxial planar type (Tr1)
Silicon PNP epitaxial planar type (Tr2)

For switching circuits
For digital circuits

■ Features

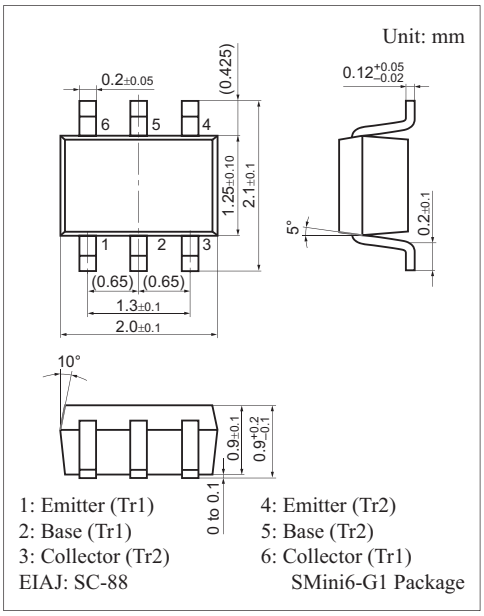
- Two elements incorporated into one package (Transistors with built-in resistor)
- SMini type package, reduction of the mounting area and assembly cost

■ Basic Part Number

- UNR32A1 + UNR31A1

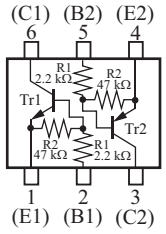
■ Absolute Maximum Ratings $T_a = 25°C$

Parameter		Symbol	Rating	Unit
Tr1	Collector-base voltage (Emitter open)	V_{CBO}	50	V
	Collector-emitter voltage (Base open)	V_{CEO}	50	V
	Collector current	I_C	100	mA
Tr2	Collector-base voltage (Emitter open)	V_{CBO}	−50	V
	Collector-emitter voltage (Base open)	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: 8C

Internal Connection



■ Electrical Characteristics T_a = 25°C±3°C

• Tr1

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)	V_{CBO}	I_C = 10 μA, I_E = 0	50			V
Collector-emitter voltage (Base open)	V_{CEO}	I_C = 2 mA, I_B = 0	50			V
Collector-base cutoff current (Emitter open)	I_{CBO}	V_{CB} = 50 V, I_E = 0			0.1	μA
Collector-emitter cutoff current (Base open)	I_{CEO}	V_{CE} = 50 V, I_B = 0			0.5	μA
Emitter-base cutoff current (Collector open)	I_{EBO}	V_{EB} = 6 V, I_C = 0			0.2	mA
Forward current transfer ratio	h_{FE}	V_{CE} = 10 V, I_C = 5 mA	80			—
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C = 10 mA, I_B = 0.3 mA			0.25	V
Output voltage high-level	V_{OH}	V_{CC} = 5 V, V_B = 0.5 V, R_L = 1 kΩ	4.9			V
Output voltage low-level	V_{OL}	V_{CC} = 5 V, V_B = 2.5 V, R_L = 1 kΩ			0.2	V
Input resistance	R_1		–30%	2.2	+30%	kΩ
Resistance ratio	R_1 / R_2			0.047		—
Transition frequency	f_T	V_{CB} = 10 V, I_E = –2 mA, f = 200 MHz		150		MHz

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

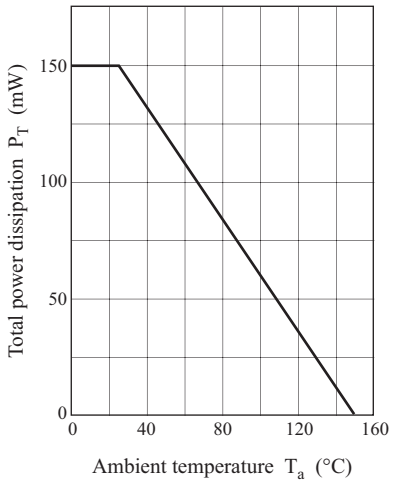
• Tr2

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)	V_{CBO}	I_C = –10 μA, I_E = 0	–50			V
Collector-emitter voltage (Base open)	V_{CEO}	I_C = –2 mA, I_B = 0	–50			V
Collector-base cutoff current (Emitter open)	I_{CBO}	V_{CB} = –50 V, I_E = 0			– 0.1	μA
Collector-emitter cutoff current (Base open)	I_{CEO}	V_{CE} = –50 V, I_B = 0			– 0.5	μA
Emitter-base cutoff current (Collector open)	I_{EBO}	V_{EB} = –6 V, I_C = 0			– 0.2	mA
Forward current transfer ratio	h_{FE}	V_{CE} = –10 V, I_C = –5 mA	80			—
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C = –10 mA, I_B = – 0.3 mA			– 0.25	V
Output voltage high-level	V_{OH}	V_{CC} = –5 V, V_B = – 0.5 V, R_L = 1 kΩ	–4.9			V
Output voltage low-level	V_{OL}	V_{CC} = –5 V, V_B = –2.5 V, R_L = 1 kΩ			– 0.2	V
Input resistance	R_1		–30%	2.2	+30%	kΩ
Resistance ratio	R_1 / R_2			0.047		—
Transition frequency	f_T	V_{CB} = –10 V, I_E = 1 mA, f = 200 MHz		80		MHz

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

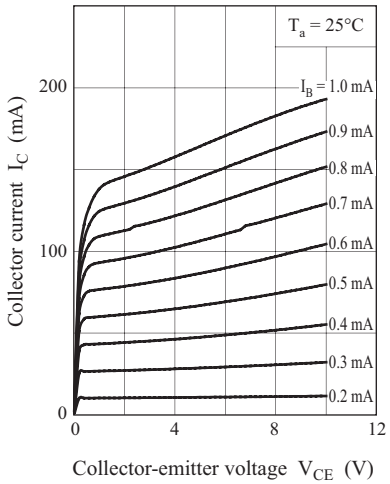
Common characteristics chart

P_T — T_a

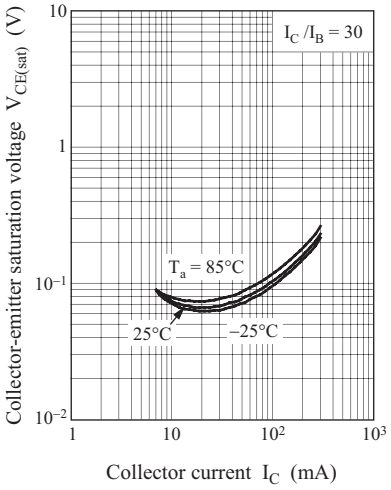


Characteristics charts of Tr1

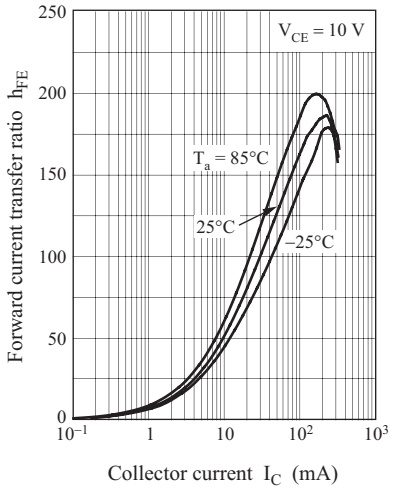
I_C — V_{CE}



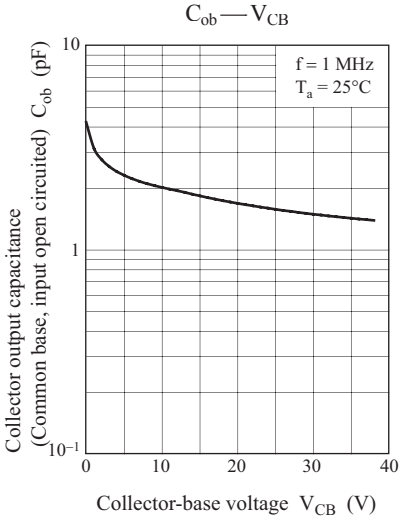
$V_{CE(sat)}$ — I_C



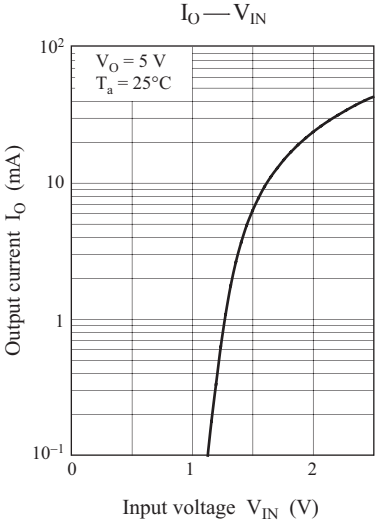
h_{FE} — I_C



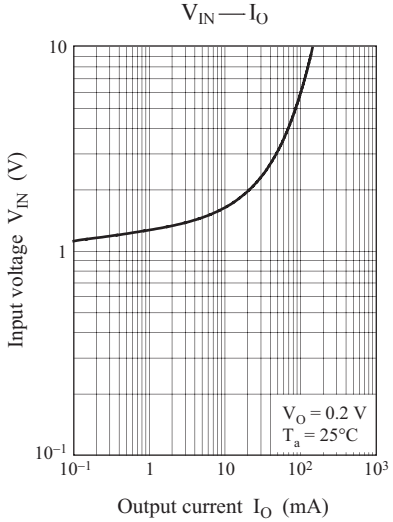
C_{ob} — V_{CB}



I_O — V_{IN}

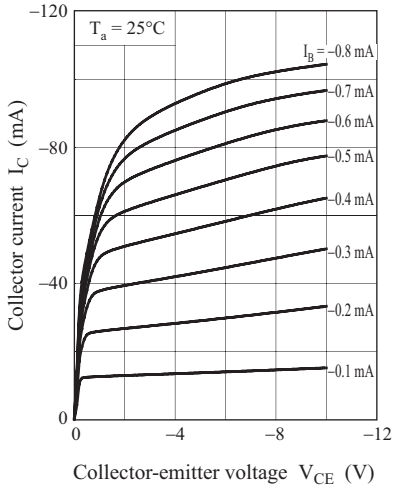


V_{IN} — I_O

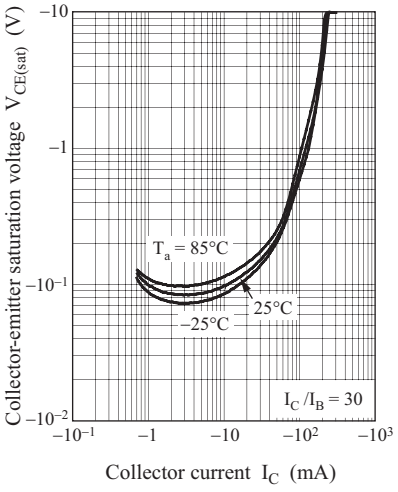


Characteristics charts of Tr2

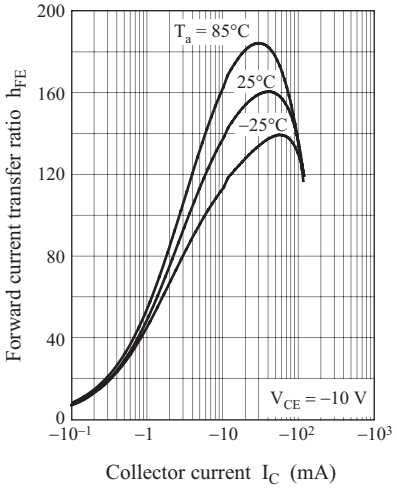
I_C — V_{CE}



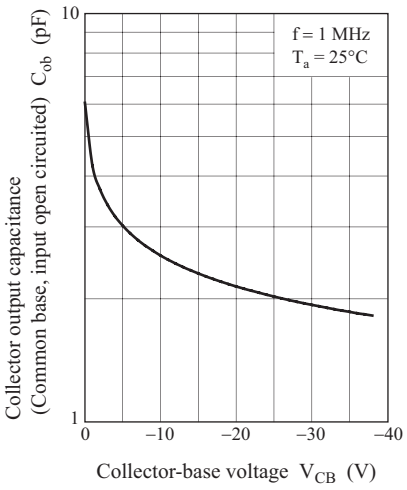
$V_{CE(sat)}$ — I_C



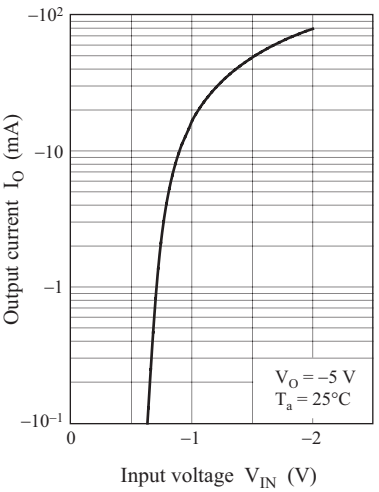
h_{FE} — I_C



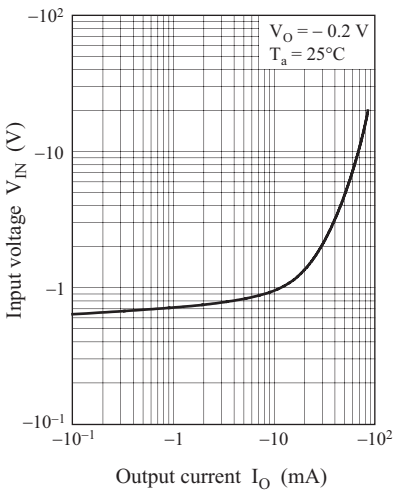
C_{ob} — V_{CB}



I_O — V_{IN}



V_{IN} — I_O



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