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# UP05C8B

Silicon NPN epitaxial planar type (Tr)  
Silicon epitaxial planar type (CCD load device)

For CCD output circuits

## ■ Features

- Two elements incorporated into one package (Tr + CCD load device)
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts.

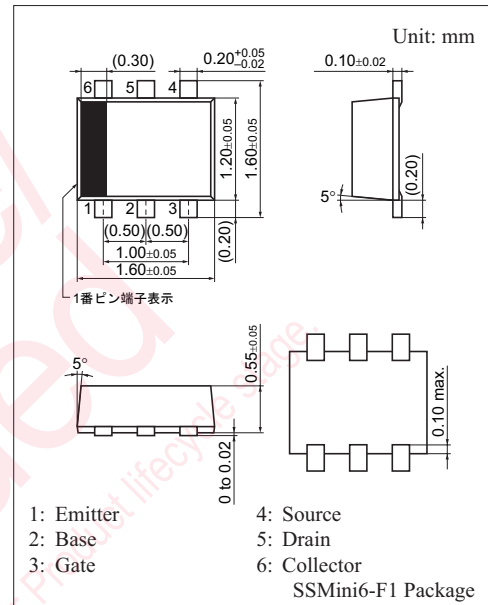
## ■ Basic Part Number

- 2SC3931 + CCD load device

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

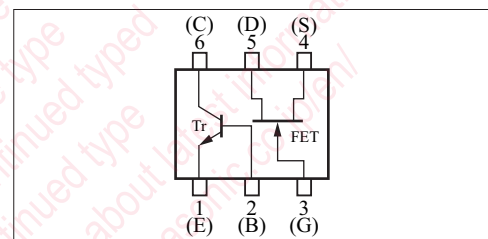
	Parameter	Symbol	Rating	Unit
Tr	Collector-base voltage (Emitter open)	$V_{CB0}$	30	V
	Collector-emitter voltage (Base open)	$V_{CEO}$	20	V
	Emitter-base voltage (Collector open)	$V_{EBO}$	3	V
	Collector current	$I_C$	15	mA
CCD load device	Limiting element voltage	$V_{max}$	40	V
	Limiting element current	$I_{max}$	10	mA
Overall	Total power dissipation *	$P_T$	125	mW
	Junction temperature	$T_j$	125	$^\circ\text{C}$
	Storage temperature	$T_{stg}$	-55 to +125	$^\circ\text{C}$

Note) \* : Measuring on substrate at 17 mm × 10 mm × 1 mm



Marking Symbol: 4F

Internal Connection



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

• Tr

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)	$V_{\text{CBO}}$	$I_{\text{C}} = 10 \mu\text{A}, I_{\text{E}} = 0$	30			V
Emitter-base voltage (Collector open)	$V_{\text{EBO}}$	$I_{\text{E}} = 10 \mu\text{A}, I_{\text{C}} = 0$	3			V
Base-emitter voltage	$V_{\text{BE}}$	$V_{\text{CE}} = 6 \text{ V}, I_{\text{C}} = 1 \text{ mA}$		720		mV
Forward current transfer ratio	$h_{\text{FE}}$	$V_{\text{CE}} = 6 \text{ V}, I_{\text{C}} = 1 \text{ mA}$	65		160	—
Reverse transfer capacitance (Common emitter)	$C_{\text{re}}$	$V_{\text{CB}} = 6 \text{ V}, I_{\text{E}} = -1 \text{ mA}, f = 10.7 \text{ MHz}$		0.8		pF
Transition frequency	$f_{\text{T}}$	$V_{\text{CB}} = 6 \text{ V}, I_{\text{E}} = -1 \text{ mA}, f = 200 \text{ MHz}$		640		MHz
Noise figure	NF	$V_{\text{CB}} = 6 \text{ V}, I_{\text{E}} = -1 \text{ mA}, f = 100 \text{ MHz}$		3.3		dB
Power gain	$G_{\text{P}}$	$V_{\text{CB}} = 6 \text{ V}, I_{\text{E}} = -1 \text{ mA}, f = 100 \text{ MHz}$		24		dB

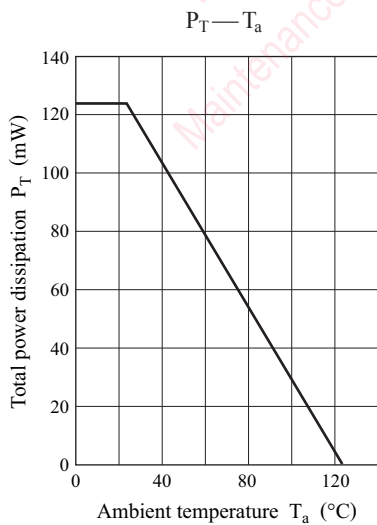
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

• CCD Load Device

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Pinch off current	$I_{\text{P}}$	$V_{\text{DS}} = 10 \text{ V}, V_{\text{G}} = 0$	3.5		5.5	mA
Output impedance	$Z_{\text{O}}$	$V_{\text{DS}} = 10 \text{ V}, V_{\text{G}} = 0$		0.05		$\text{M}\Omega$

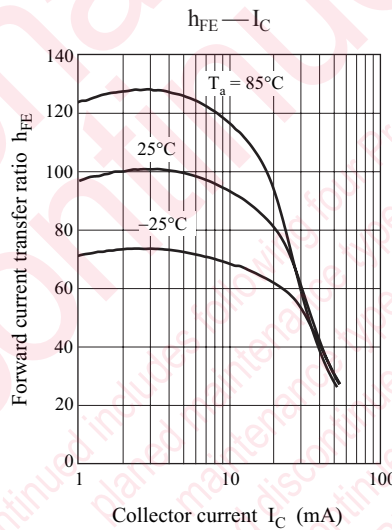
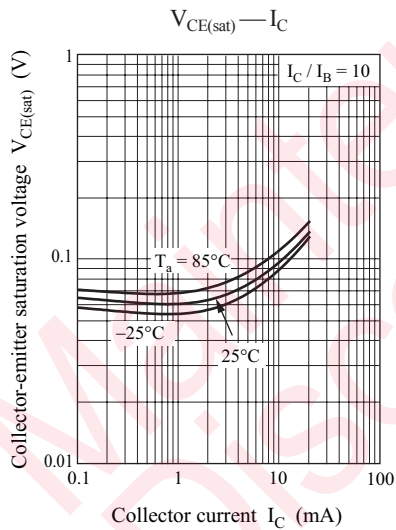
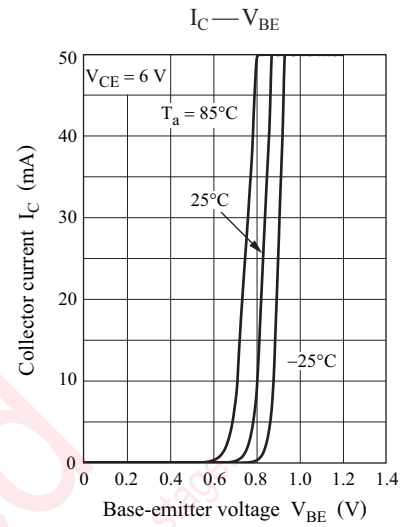
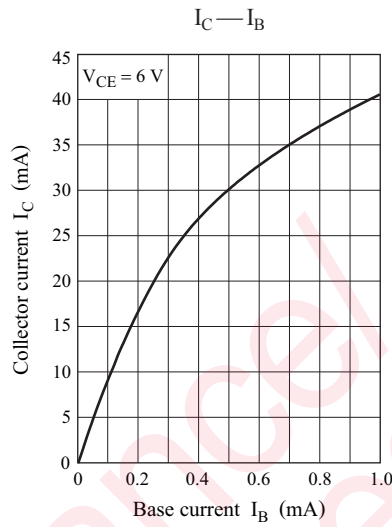
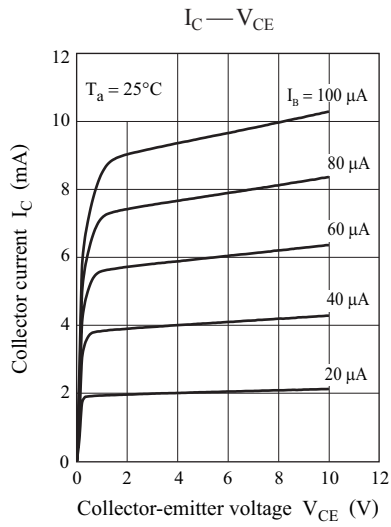
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

Common characteristics chart

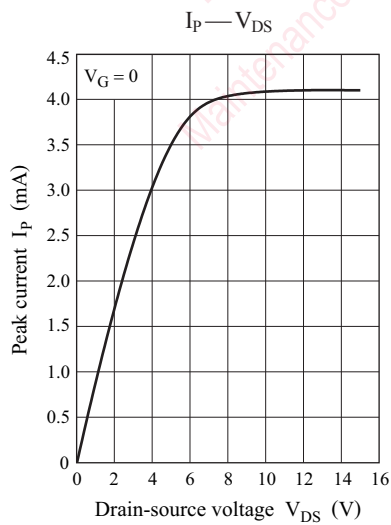




Characteristics charts of Tr



Characteristics charts of CCD load device



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