

# 2SA2057

## Silicon PNP epitaxial planar type

Power supply for audio & visual equipments  
such as TVs and VCRs  
Industrial equipments such as DC-DC converters

### ■ Features

- High speed switching ( $t_{stg}$ : storage time/ $t_f$ : fall time is short)
- Low collector-emitter saturation voltage  $V_{CE(sat)}$
- Superior forward current transfer ratio  $h_{FE}$  linearity
- TO-220D built-in: Excellent package with withstand voltage 5 kV guaranteed

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

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	$V_{CBO}$	-60	V
Collector-emitter voltage (Base open)	$V_{CEO}$	-60	V
Emitter-base voltage (Collector open)	$V_{EBO}$	-6	V
Collector current	$I_C$	-3	A
Peak collector current *	$I_{CP}$	-6	A
Collector power dissipation	$P_C$	20	W
	$T_a = 25^\circ\text{C}$	2.0	
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

Note) \*: Non-repetitive peak collector current

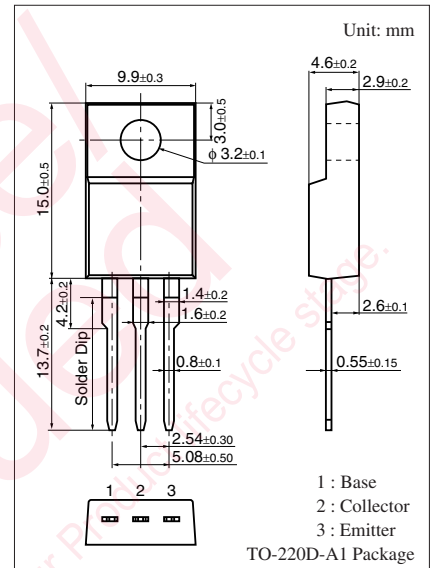
### ■ Electrical Characteristics $T_C = 25^\circ\text{C} \pm 3^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-emitter voltage (Base open)	$V_{CEO}$	$I_C = -10 \text{ mA}, I_B = 0$	-60			V
Collector-base cutoff current (Emitter open)	$I_{CBO}$	$V_{CB} = -60 \text{ V}, I_E = 0$			-100	$\mu\text{A}$
Collector-emitter cutoff current (Base open)	$I_{CEO}$	$V_{CE} = -60 \text{ V}, I_B = 0$			-100	$\mu\text{A}$
Emitter-base cutoff current (Collector open)	$I_{EBO}$	$V_{EB} = -6 \text{ V}, I_C = 0$			-1	mA
Forward current transfer ratio	$h_{FE1}$ *	$V_{CE} = -4 \text{ V}, I_C = -1 \text{ A}$	120		320	—
	$h_{FE2}$	$V_{CE} = -4 \text{ V}, I_C = -3 \text{ A}$	40			
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -3 \text{ A}, I_B = -0.375 \text{ A}$			-0.5	V
Transition frequency	$f_T$	$V_{CE} = -10 \text{ V}, I_C = -0.1 \text{ A}, f = 10 \text{ MHz}$		90		MHz
Turn-on time	$t_{on}$	$I_C = -1 \text{ A}$ , Resistance loaded		0.15	0.30	$\mu\text{s}$
Storage time	$t_{stg}$	$I_{B1} = -0.1 \text{ A}, I_{B2} = 0.1 \text{ A}$		0.4	0.7	$\mu\text{s}$
Fall time	$t_f$	$V_{CC} = 50 \text{ V}$		0.10	0.15	$\mu\text{s}$

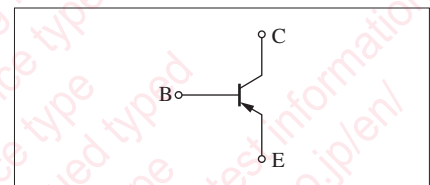
Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

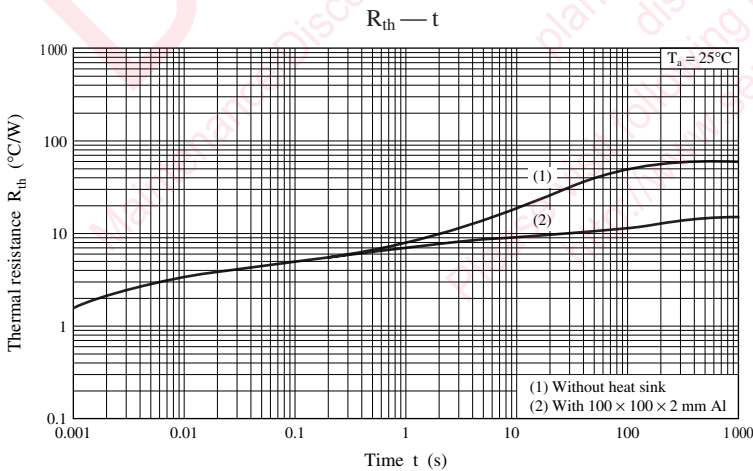
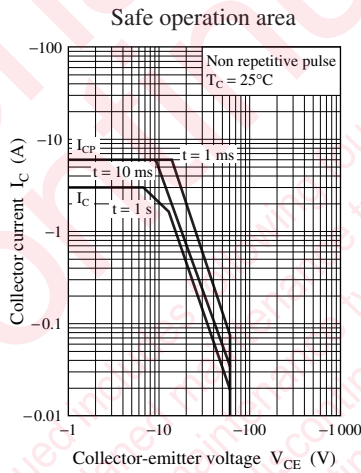
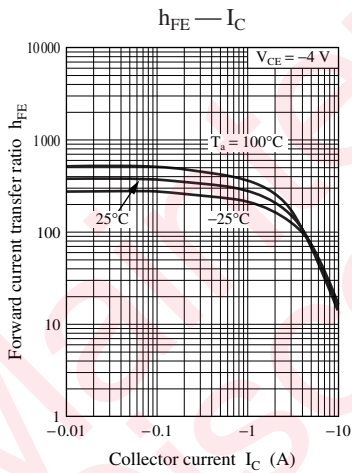
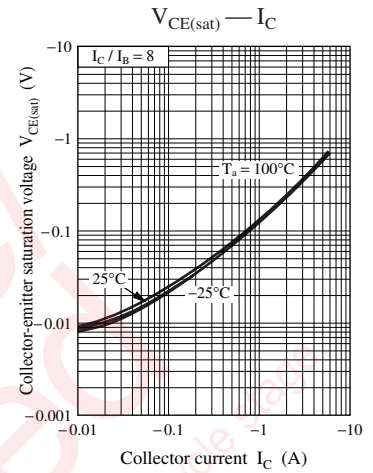
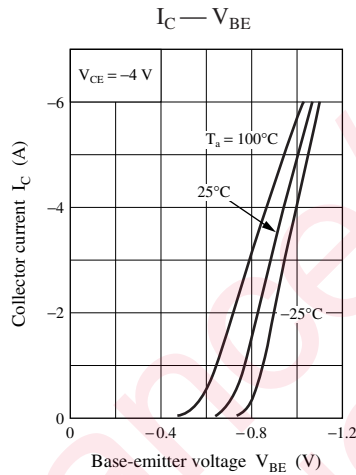
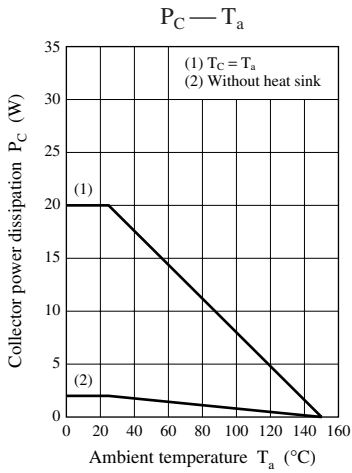
2. \*: Rank classification

Rank	Q	P
$h_{FE1}$	120 to 250	160 to 320



### Internal Connection





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