

# 2SA2009

## Silicon PNP epitaxial planar type

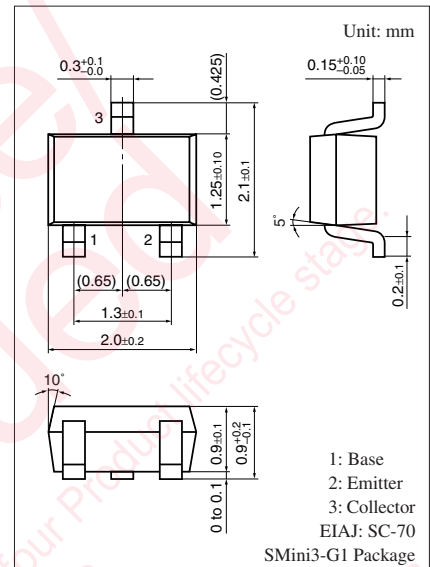
For low-frequency high breakdown voltage amplification

### ■ Features

- High collector-emitter voltage (Base open)  $V_{CEO}$
- Low noise voltage NV
- S-Mini type package, allowing downsizing and thinning of the equipment and automatic insertion through the tape packing.

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

Parameter	Symbol	Rating	Unit
Collector-base voltage (Emitter open)	$V_{CBO}$	-120	V
Collector-emitter voltage (Base open)	$V_{CEO}$	-120	V
Emitter-base voltage (Collector open)	$V_{EBO}$	-5	V
Collector current	$I_C$	-20	mA
Peak collector current	$I_{CP}$	-50	mA
Collector power dissipation	$P_C$	150	mW
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$



Marking Symbol: AR

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Collector-base voltage (Emitter open)	$V_{CBO}$	$I_C = -10 \mu\text{A}$ , $I_E = 0$	-120			V
Collector-emitter voltage (Base open)	$V_{CEO}$	$I_C = -1 \text{ mA}$ , $I_B = 0$	-120			V
Emitter-base voltage (Collector open)	$V_{EBO}$	$I_E = -10 \mu\text{A}$ , $I_C = 0$	-5			V
Collector-base cutoff current (Emitter open)	$I_{CBO}$	$V_{CB} = -50 \text{ V}$ , $I_E = 0$			-100	nA
Collector-emitter cutoff current (Base open)	$I_{CEO}$	$V_{CE} = -50 \text{ V}$ , $I_B = 0$			-1	$\mu\text{A}$
Forward current transfer ratio *	$h_{FE}$	$V_{CE} = -5 \text{ V}$ , $I_C = -2 \text{ mA}$	180		700	—
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -20 \text{ mA}$ , $I_B = -2 \text{ mA}$			-0.6	V
Transition frequency	$f_T$	$V_{CB} = -5 \text{ V}$ , $I_E = 2 \text{ mA}$ , $f = 200 \text{ MHz}$		200		MHz
Noise voltage	NV	$V_{CE} = -40 \text{ V}$ , $I_C = -1 \text{ mA}$ , $G_V = 80 \text{ dB}$ $R_g = 100 \text{ k}\Omega$ , Function = FLAT			130	mV

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

2. \*: Rank classification

Rank	R	S	T
$h_{FE}$	180 to 360	260 to 520	360 to 700

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