

# 2SA2009

## Silicon PNP epitaxial planer type

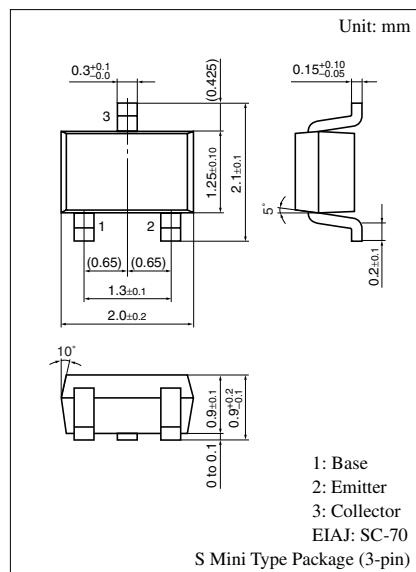
For low-frequency high breakdown voltage amplification

### ■ Features

- High collector to emitter voltage  $V_{CEO}$
- Low noise voltage NV

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

| Parameter                    | Symbol    | Rating      | Unit             |
|------------------------------|-----------|-------------|------------------|
| Collector to base voltage    | $V_{CBO}$ | -120        | V                |
| Collector to emitter voltage | $V_{CEO}$ | -120        | V                |
| Emitter to base voltage      | $V_{EBO}$ | -5          | V                |
| Peak collector current       | $I_{CP}$  | -50         | mA               |
| Collector current            | $I_C$     | -20         | 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 cutoff current                | $I_{CBO}$     | $V_{CB} = -50\text{ V}, I_E = 0$                                                                                        |      |     | -100 | nA            |
|                                         | $I_{CEO}$     | $V_{CE} = -50\text{ V}, I_B = 0$                                                                                        |      |     | -1   | $\mu\text{A}$ |
| Collector to base voltage               | $V_{CBO}$     | $I_C = -10\text{ }\mu\text{A}, I_E = 0$                                                                                 | -120 |     |      | V             |
| Collector to emitter voltage            | $V_{CEO}$     | $I_C = -1\text{ mA}, I_B = 0$                                                                                           | -120 |     |      | V             |
| Emitter to base voltage                 | $V_{EBO}$     | $I_E = -10\text{ }\mu\text{A}, I_C = 0$                                                                                 | -5   |     |      | V             |
| Forward current transfer ratio *        | $h_{FE}$      | $V_{CE} = -5\text{ V}, I_C = -2\text{ mA}$                                                                              | 180  |     | 700  |               |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | $I_C = -20\text{ mA}, I_B = -2\text{ mA}$                                                                               |      |     | -0.6 | V             |
| Noise voltage                           | NV            | $V_{CE} = -40\text{ V}, I_C = -1\text{ mA}, G_v = 80\text{ dB}$<br>$R_g = 100\text{ kW}, \text{Function} = \text{FLAT}$ |      | 130 |      | mV            |
| Transition frequency                    | $f_T$         | $V_{CB} = -5\text{ V}, I_E = 2\text{ mA}, f = 200\text{ MHz}$                                                           |      | 120 |      | MHz           |

Note) \*: Rank classification

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

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