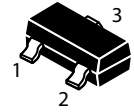
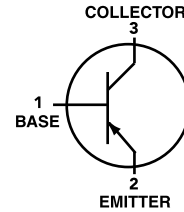


### PNP General Purpose Transistors

 Lead(Pb)-Free



**SOT-23**

### MAXIMUM RATINGS(T<sub>a</sub>=25°C)

| Rating   | Symbol           | Value       | Unit |
|--|------------------|-------------|------|
| Collector-Emitter Voltage                        | V <sub>CEO</sub> | -32         | V    |
| Collector-Base Voltage                           | V <sub>CBO</sub> | -40         | V    |
| Emitter-Base Voltage                             | V <sub>EBO</sub> | -5.0        | V    |
| Collector Current - Continuous                   | I <sub>C</sub>   | -500*       | mA   |
| Total Device Dissipation<br>T <sub>A</sub> =25°C | P <sub>D</sub>   | 0.2         | mW   |
| Junction Temperature                             | T <sub>j</sub>   | +150        | °C   |
| Storage Temperature                              | T <sub>stg</sub> | -55 to +150 | °C   |

\*P<sub>D</sub> MAX. Must not be exceeded.

### Device Marking

2SA1036KP=HP , 2SA1036KQ=HQ , 2SA1036KR=HR

## ELECTRICAL CHARACTERISTICS

| Characteristics  | Symbol        | Min  | Typ | Max | Unit          |
|--|---------------|------|-----|-----|---------------|
| Collector-Emitter Breakdown Voltage<br>$I_C = -1\text{mA}, I_E = 0\text{A}$  | $V_{(BR)CEO}$ | -32  | -   | -   | V             |
| Collector-Base Breakdown Voltage<br>$I_C = -100\mu\text{A}, I_B = 0\text{A}$ | $V_{(BR)CBO}$ | -40  | -   | -   | V             |
| Emitter-Base Breakdown Voltage<br>$I_E = 100\mu\text{A}, I_C = 0$            | $V_{(BR)EBO}$ | -5.0 | -   | -   | V             |
| Collector Cutoff Current<br>$V_{CB} = -20\text{V}, I_C = 0\text{A}$          | $I_{CBO}$     | -    | -   | 1.0 | $\mu\text{A}$ |
| Emitter Cutoff Current<br>$V_{EB} = -4\text{V}, I_C = 0\text{A}$             | $I_{EBO}$     | -    | -   | 1.0 | $\mu\text{A}$ |

## ON CHARACTERISTICS

|   |               |    |   |      |   |
|---|---------------|----|---|------|---|
| Collector-Emitter Saturation Voltage<br>$I_C = -100\text{mA}, I_B = -10\text{mA}$ | $V_{CE(sat)}$ | -  | - | -0.4 | V |
| DC Current Transfer Ration<br>$V_{CE} = -3\text{V}, I_C = -10\text{mA}$           | $h_{FE}$      | 82 | - | 390  | V |

## SMALL-SIGNAL CHARACTERISTICS

|   |       |   |     |   |     |
|---|-------|---|-----|---|-----|
| Transition frequency<br>$V_{CE} = -5\text{V}, I_E = 20\text{mA}, f = 100\text{MHz}$ | $f_T$ | - | 200 | - | MHz |
| Output Capacitance<br>$V_{CB} = -10\text{V}, I_E = 0\text{A}, f = 1.0\text{MHz}$    | Cob   | - | 7   | - | pF  |

CLASSIFICATION  $h_{FE}$ 

| Rank  | P      | Q       | R       |
|-------|--------|---------|---------|
| Range | 82-180 | 120-270 | 180-390 |

## Electrical characteristic curves

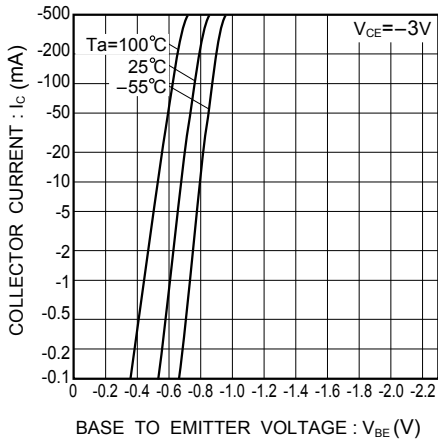


Fig.1 Grounded emitter propagation

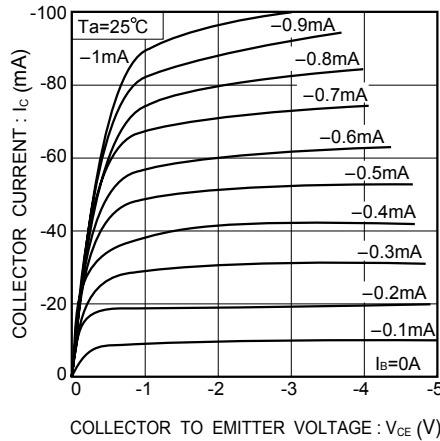


Fig.2 Grounded emitter output characteristics (I)

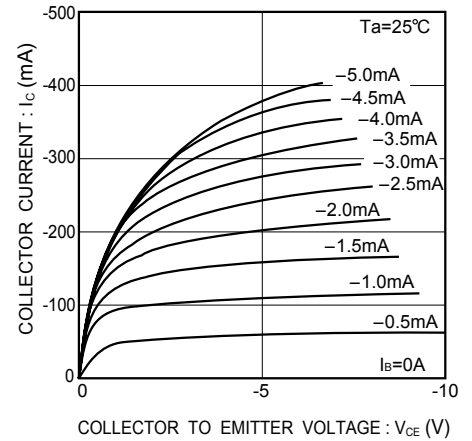


Fig.3 Ground emitter output characteristics (II)

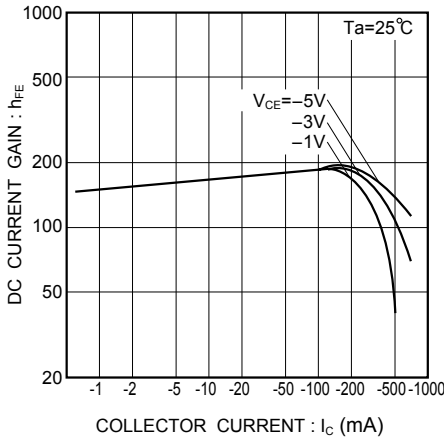


Fig.4 DC current gain vs collector current (I)

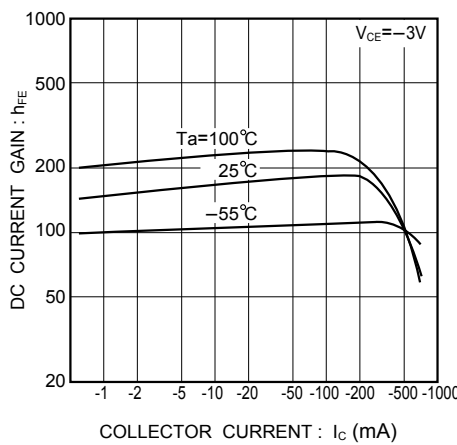


Fig.5 DC current gain vs. collector current (II)

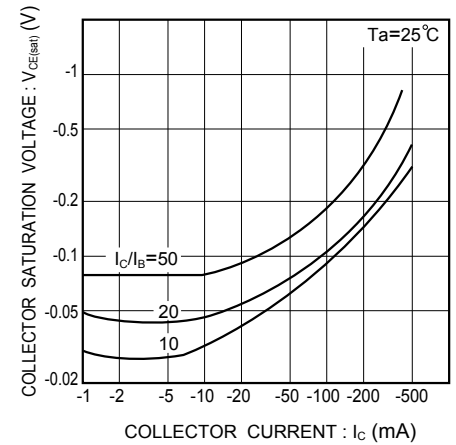


Fig.6 Collector emitter saturation voltage vs. collector current (I)

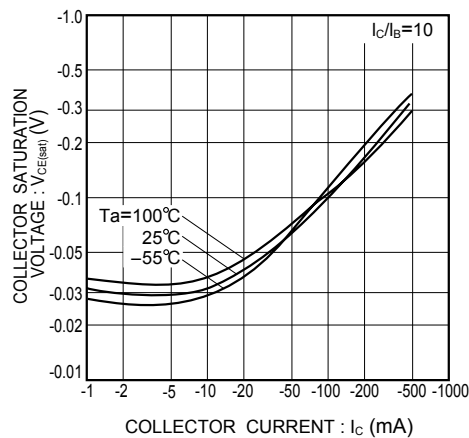


Fig.7 Collector-emitter saturation voltage vs. collector current (II)

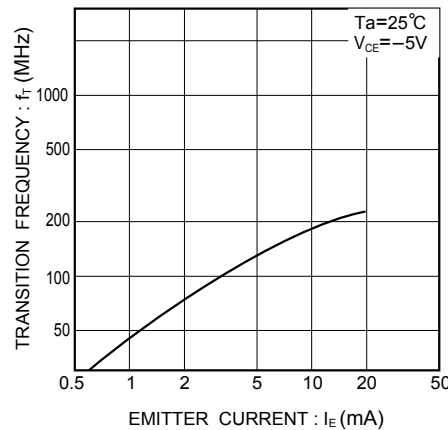


Fig.8 Gain bandwidth product vs. emitter current

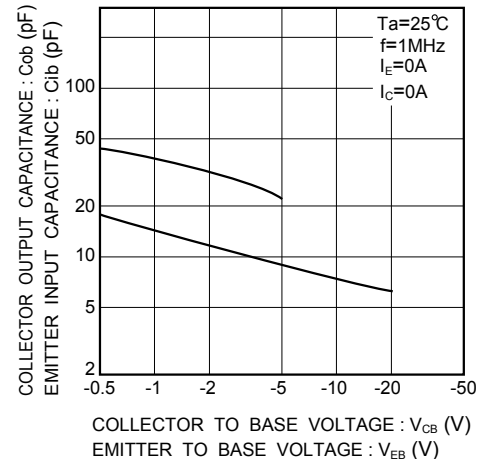
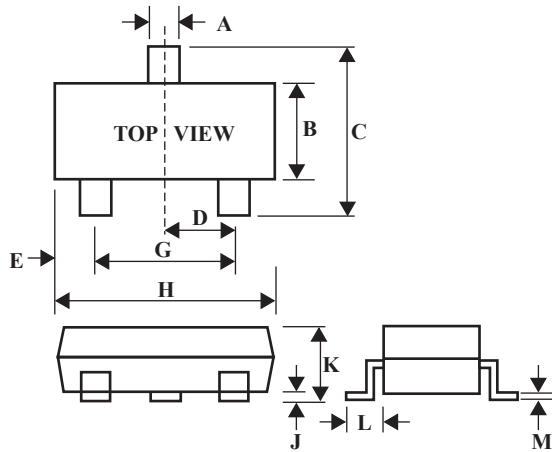


Fig.9 Collector output capacitance vs. collector-base voltage. Emitter input capacitance vs. emitter-base voltage

**SOT-23 Outline Dimension**



| SOT-23 |       |      |
|--------|-------|------|
| Dim    | Min   | Max  |
| A      | 0.35  | 0.51 |
| B      | 1.19  | 1.40 |
| C      | 2.10  | 3.00 |
| D      | 0.85  | 1.05 |
| E      | 0.46  | 1.00 |
| G      | 1.70  | 2.10 |
| H      | 2.70  | 3.10 |
| J      | 0.01  | 0.13 |
| K      | 0.89  | 1.10 |
| L      | 0.30  | 0.61 |
| M      | 0.076 | 0.25 |