

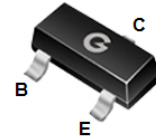
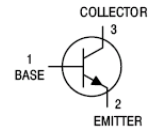
## Features

- Low noise and high gain
- High power gain
- RoHS compliant with Halogen-free

HF

## Mechanical Data

- Case: SOT-23
- Molding compound: UL flammability classification rating 94V-0
- Terminals: Tin-plated; solderability per MIL-STD-202, Method 208



SOT-23

## Ordering Information

| Part Number | Package | Shipping Quantity      | Marking Code |
|-------------|---------|------------------------|--------------|
| 2SC3356-Q   | SOT-23  | 3000 pcs / Tape & Reel | R23          |
| 2SC3356-R   | SOT-23  | 3000 pcs / Tape & Reel | R24          |
| 2SC3356-S   | SOT-23  | 3000 pcs / Tape & Reel | R25          |

## Maximum Ratings (@ T<sub>A</sub> = 25°C unless otherwise specified)

| Parameter                           | Symbol           | Value | Unit |
|-------------------------------------|------------------|-------|------|
| Collector-Base Breakdown Voltage    | V <sub>CBO</sub> | 20    | V    |
| Collector-Emitter Breakdown Voltage | V <sub>CEO</sub> | 12    | V    |
| Emitter-Base Breakdown Voltage      | V <sub>EBO</sub> | 3     | V    |
| Collector Current (continuous)      | I <sub>C</sub>   | 100   | mA   |

## Thermal Characteristics

| Parameter                                         | Symbol           | Value      | Unit |
|---------------------------------------------------|------------------|------------|------|
| Collector Power Dissipation <sup>*1</sup>         | P <sub>C</sub>   | 200        | mW   |
| Thermal Resistance Junction-to-Air <sup>*1</sup>  | R <sub>θJA</sub> | 375        | °C/W |
| Thermal Resistance Junction-to-Case <sup>*1</sup> | R <sub>θJC</sub> | 294        | °C/W |
| Thermal Resistance Junction-to-Lead <sup>*1</sup> | R <sub>θJL</sub> | 226        | °C/W |
| Junction Temperature Range                        | T <sub>J</sub>   | -55 ~ +150 | °C   |
| Storage Temperature Range                         | T <sub>STG</sub> | -65 ~ +150 | °C   |

Note 1: The data tested by surface mounted on a 16mm \* 18mm \* 2mm FR4-epoxy P.C.B

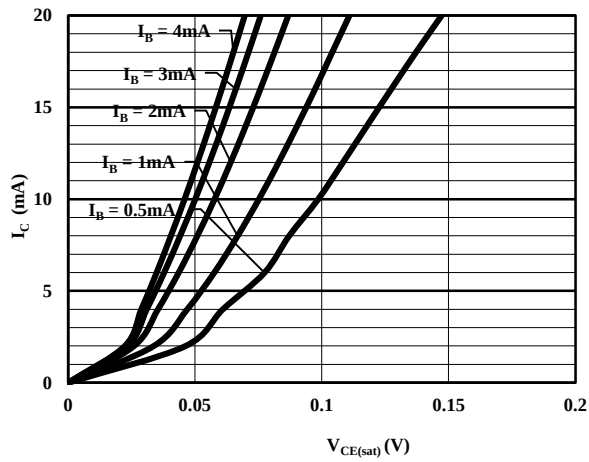
### Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

| Parameter                            | Symbol        | Test Condition                                                | Min. | Typ.  | Max. | Unit          |
|--------------------------------------|---------------|---------------------------------------------------------------|------|-------|------|---------------|
| Collector-Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C = 10\mu\text{A}, I_E = 0$                                | 20   | -     | -    | V             |
| Collector-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C = 1\text{mA}, I_B = 0$                                   | 12   | -     | -    | V             |
| Emitter-Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E = 10\mu\text{A}, I_C = 0$                                | 3    | -     | -    | V             |
| Collector Cut-off Current            | $I_{CBO}$     | $V_{CB} = 10\text{V}, I_E = 0$                                | -    | -     | 1    | $\mu\text{A}$ |
| Emitter Cut-off Current              | $I_{EBO}$     | $V_{EB} = 1\text{V}, I_C = 0$                                 | -    | -     | 1    | $\mu\text{A}$ |
| DC Current Gain                      | $h_{FE}$      | $V_{CE} = 10\text{V}, I_C = 20\text{mA}$                      | 50   | 120   | 300  | -             |
| Collector-emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 20\text{mA}, I_B = 4\text{mA}$                         | -    | -     | 0.5  | V             |
| Base-emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C = 20\text{mA}, I_B = 4\text{mA}$                         | -    | -     | 1.1  | V             |
| Transition Frequency                 | $f_T$         | $I_C = 20\text{mA}, V_{CE} = 10\text{V}$                      | -    | 7     | -    | GHz           |
| Insertion Power Gain                 | $ S_{21e} ^2$ | $V_{CE} = 10\text{V}, I_C = 20\text{mA}$<br>$f = 1\text{GHz}$ | -    | 11.50 | -    | dB            |
| Output Capacitance                   | $C_{ob}$      | $V_{CB} = 10\text{V}, I_E = 0\text{A}, f = 1\text{MHz}$       | -    | 0.55  | 1.0  | pF            |
| Noise Figure                         | $N_F$         | $V_{CE} = 10\text{V}, I_C = 7\text{mA}$<br>$f = 1\text{GHz}$  | -    | 1.10  | 2.0  | dB            |

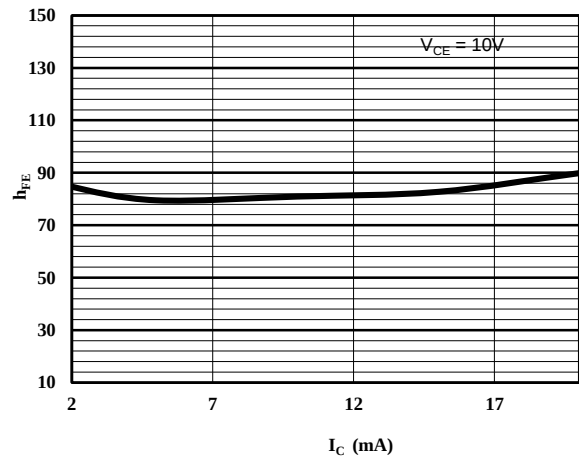
### Classification of $h_{FE}$

| Rank    | Q        | R        | S         |
|---------|----------|----------|-----------|
| Range   | 50 ~ 100 | 80 ~ 160 | 125 ~ 250 |
| Marking | R23      | R24      | R25       |

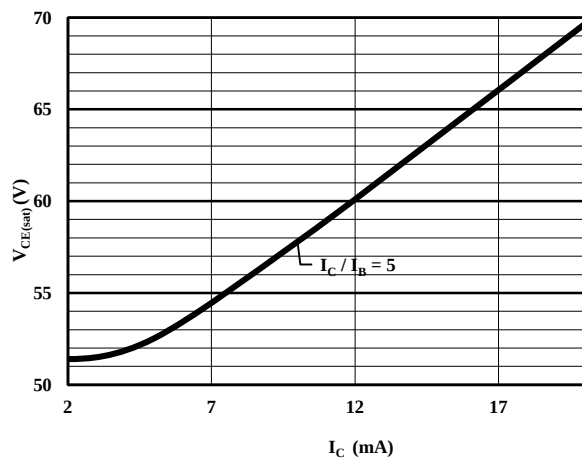
**Ratings and Characteristics Curves** (@  $T_A = 25^\circ\text{C}$  unless otherwise specified)



**Fig 1 Output Characteristics**

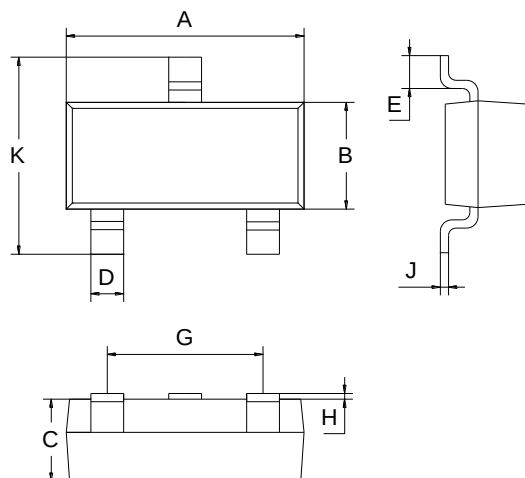


**Fig 2 DC Current Gain vs. Collector Current**



**Fig 3 Collector-Emitter Saturation Voltage vs. Collector Current**

Package Outline Dimensions (Unit: mm)



| SOT-23    |      |      |
|-----------|------|------|
| Dimension | Min. | Max. |
| A         | 2.70 | 3.10 |
| B         | 1.10 | 1.50 |
| C         | 0.90 | 1.10 |
| D         | 0.30 | 0.50 |
| E         | 0.35 | 0.48 |
| G         | 1.80 | 2.00 |
| H         | 0.02 | 0.10 |
| J         | 0.05 | 0.15 |
| K         | 2.20 | 2.60 |

Package Outline Dimensions (Unit: mm)

SOT-23

