



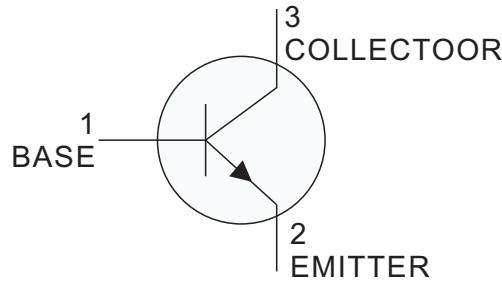
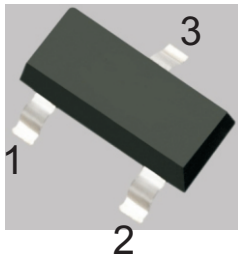
General Purpose Transistor

NPN Silicon

FEATURES

- Complementary to S9015

SOT-23



MAXIMUM RATINGS

| Rating                         | Symbol    | Value | Unit |
|--------------------------------|-----------|-------|------|
| Collector–Emitter Voltage      | $V_{CEO}$ | 45    | Vdc  |
| Collector–Base Voltage         | $V_{CBO}$ | 50    | Vdc  |
| Emitter–Base Voltage           | $V_{EBO}$ | 5.0   | Vdc  |
| Collector Current — Continuous | $I_C$     | 100   | mAdc |

THERMAL CHARACTERISTICS

| Characteristic  | Symbol         | Max          | Unit             |
|---|----------------|--------------|------------------|
| Total Device Dissipation FR– 5 Board, (1)<br>$T_A = 25^\circ\text{C}$ | $P_D$          | 200          | mW               |
| Junction and Storage Temperature                                      | $T_J, T_{stg}$ | - 55 to +150 | $^\circ\text{C}$ |

ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$  unless otherwise noted.)  
OFF CHARACTERISTICS

| Characteristic  | Symbol        | Min | Max | Unit            |
|---|---------------|-----|-----|-----------------|
| Collector–Emitter Breakdown Voltage(3)<br>( $I_C = 0.1 \text{ mAdc}, I_E = 0$ ) | $V_{(BR)CEO}$ | 45  | –   | Vdc             |
| Collector–Base Breakdown Voltage<br>( $I_C = 100 \mu\text{Adc}, I_E = 0$ )      | $V_{(BR)CBO}$ | 50  | –   | Vdc             |
| Emitter–Base Breakdown Voltage<br>( $I_E = 100 \mu\text{Adc}, I_C = 0$ )        | $V_{(BR)EBO}$ | 5.0 | –   | Vdc             |
| Collector cut-off current<br>( $V_{CB} = 50 \text{ Vdc}, I_E = 0$ )             | $I_{CBO}$     | –   | 0.1 | $\mu\text{Adc}$ |
| Collector cut-off current<br>( $V_{CE} = 35 \text{ Vdc}, I_B = 0$ )             | $I_{CEO}$     | –   | 1   | $\mu\text{Adc}$ |
| Emitter cut-off current<br>( $V_{EB} = 3 \text{ Vdc}, I_C = 0$ )                | $I_{EBO}$     | –   | 0.1 | $\mu\text{Adc}$ |

1. FR–5 = 1.0 x 0.75 x 0.062 in.
2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.
3. Pulse Test: Pulse Width <300  $\mu\text{s}$ , Duty Cycle <2.0%.



**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted) (Continued)  
ON CHARACTERISTICS (3)**

| Characteristic  | Symbol               | Min | Max  | Unit            |
|---|----------------------|-----|------|-----------------|
| DC Current Gain<br>(I <sub>C</sub> = 1.0 mA <sub>dc</sub> , V <sub>CE</sub> = 5 V <sub>dc</sub> )                         | S9014-L              | 200 | 450  | —               |
|   | S9014-H              | 450 | 1000 |                 |
| Collector–Emitter Saturation Voltage<br>(I <sub>C</sub> = 100 mA <sub>dc</sub> , I <sub>B</sub> = 5 mA <sub>dc</sub> )(3) | V <sub>CE(sat)</sub> | —   | 0.3  | V <sub>dc</sub> |
| Base–Emitter Saturation Voltage(3)<br>(I <sub>C</sub> = 100 mA <sub>dc</sub> , I <sub>B</sub> = 5mA <sub>dc</sub> )       | V <sub>BE(sat)</sub> | —   | 1.0  | V <sub>dc</sub> |

**SMALL–SIGNAL CHARACTERISTICS**

|   |                |     |   |     |
|---|----------------|-----|---|-----|
| Current–Gain — Bandwidth Product<br>(I <sub>C</sub> = 10mA <sub>dc</sub> , V <sub>CE</sub> = 5.0V <sub>dc</sub> , f =30MHz) | f <sub>t</sub> | 150 | — | MHz |
|---|----------------|-----|---|-----|

**CLASSIFICATION OF h<sub>FE</sub>**

| Rank  | L       | H        |
|-------|---------|----------|
| Range | 200-450 | 450-1000 |

3. Pulse Test: Pulse Width <300 μs, Duty Cycle <2.0%.



### TYPICAL CHARACTERISTICS

Fig.1 Power Derating Curve

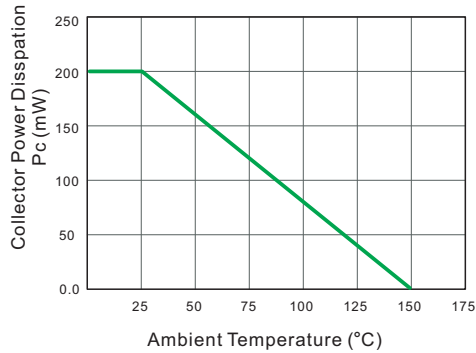


Fig.2 Static characteristics

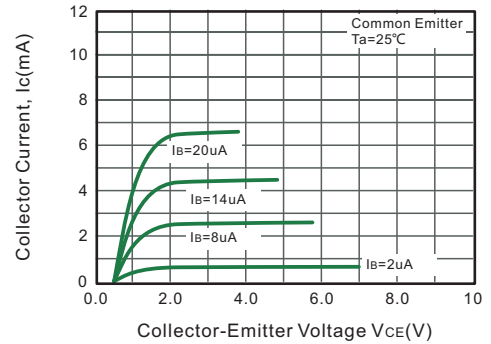


Fig.3 hFE--Ic

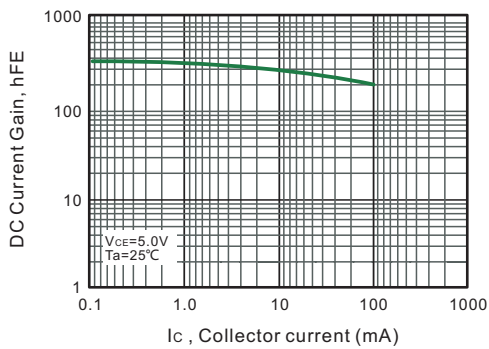


Fig.4 Ic--VBE

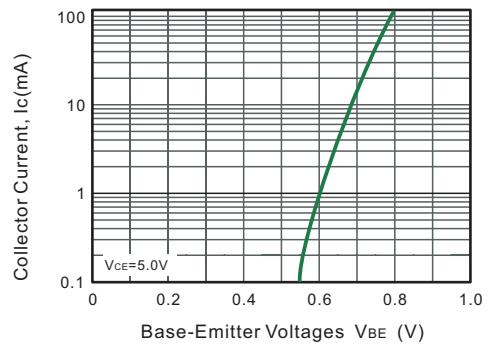


Fig.5 VBEsat--Ic

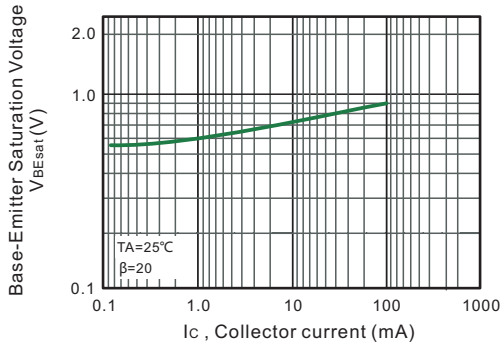


Fig.6 VCEsat--Ic

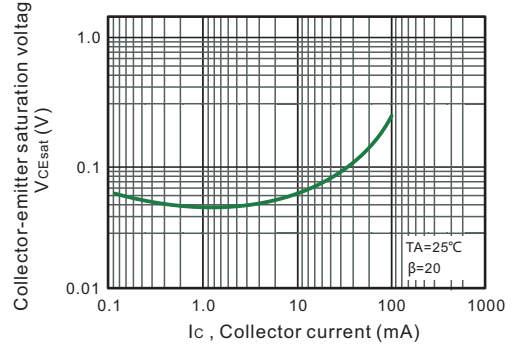


Fig.7 fr--Ic

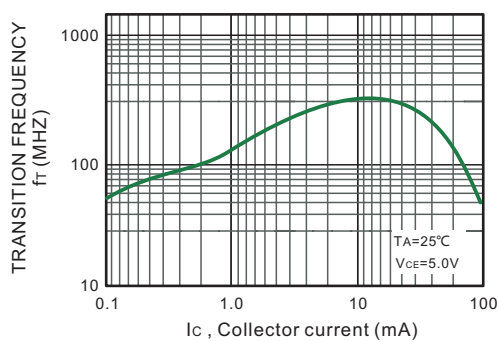
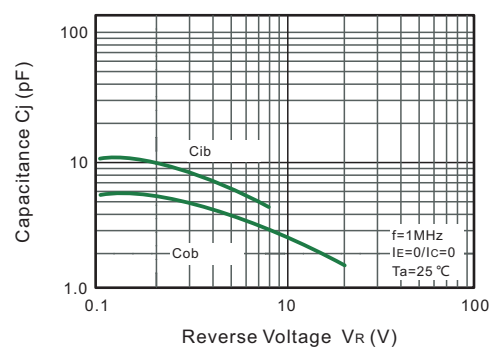
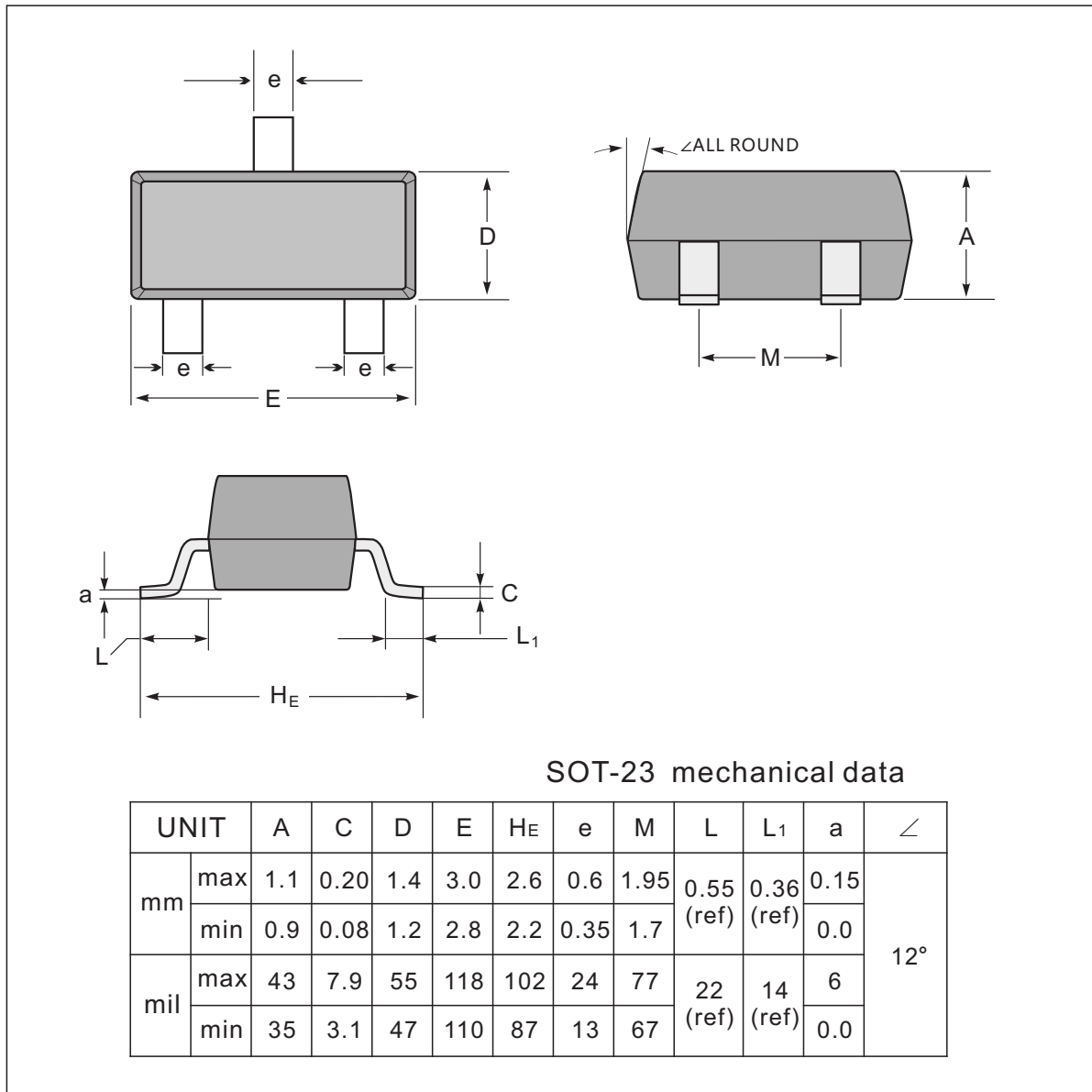


Fig.8 Cob/Cib--Vcb/Veb

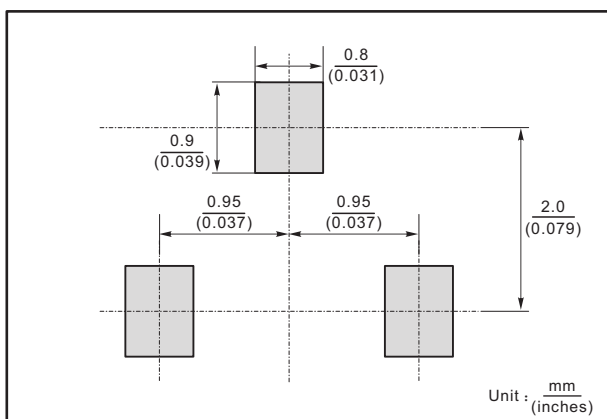




### SOT-23 Package Outline Dimensions



#### The recommended mounting pad size



#### Marking

| Type number | Marking code |
|-------------|--------------|
| S9014-L     | J6L          |
| S9014-H     | J6H          |

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