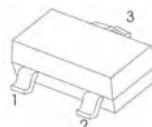




## FEATURES

- For Switching and AF Amplifier Applications.

### SOT-23



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1.BASE  
2.EMITTER  
3.COLLECTOR

## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

### Absolute Maximum Ratings

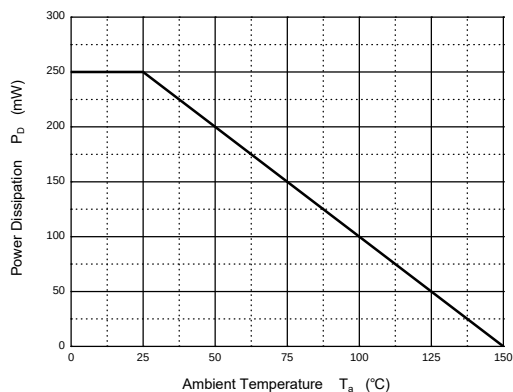
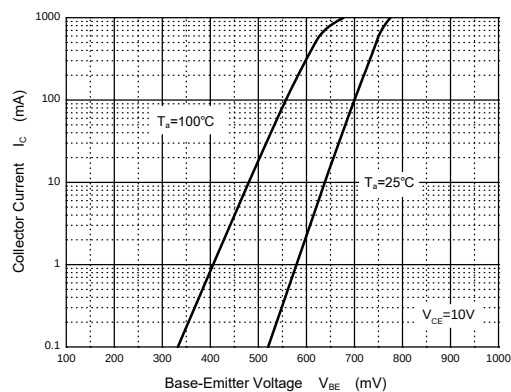
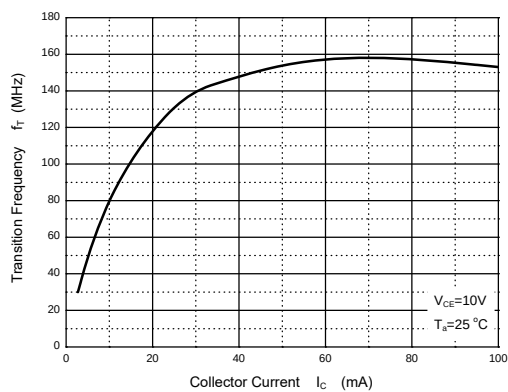
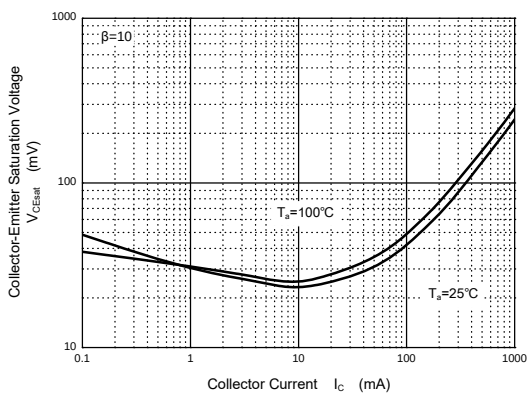
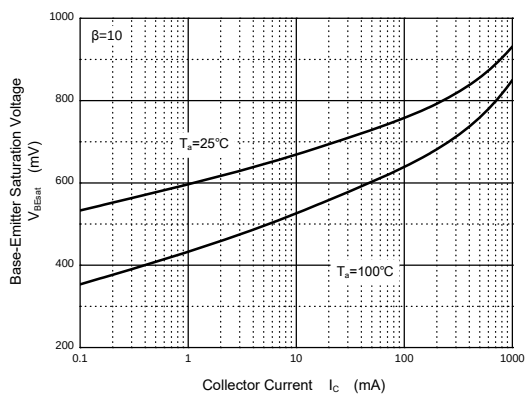
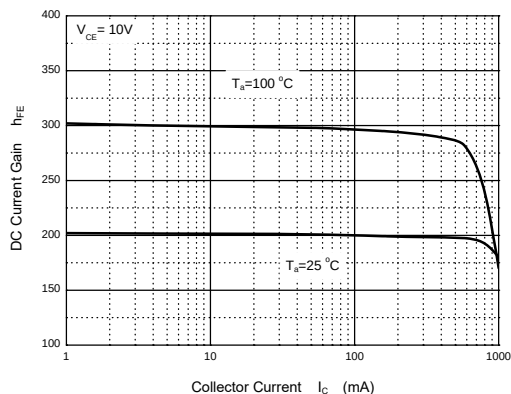
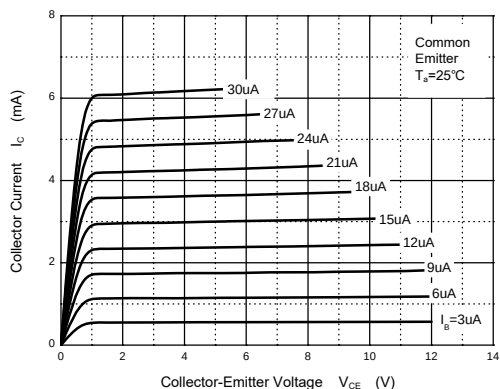
Ratings at 25°C ambient temperature unless otherwise specified.

| Parameter                 | Symbol    | Value       | Unit |
|---------------------------|-----------|-------------|------|
| Collector Base Voltage    | $V_{CBO}$ | 120         | V    |
| Collector Emitter Voltage | $V_{CEO}$ | 100         | V    |
| Emitter Base Voltage      | $V_{EBO}$ | 5           | V    |
| Collector Current         | $I_C$     | 1           | A    |
| Maximum Power Dissipation | $P_D$     | 250         | mW   |
| Junction Temperature      | $T_J$     | 150         | °C   |
| Storage Temperature Range | $T_{STG}$ | -55 to +150 | °C   |

Electrical Characteristics  $T_a = 25^\circ\text{C}$

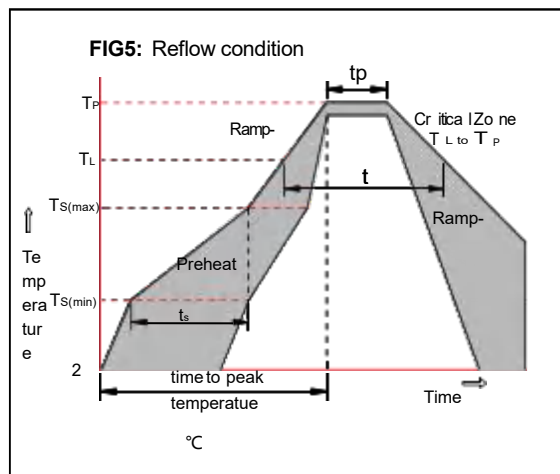
| Parameter                                                                                                                                                                                                                                       | Symbol        | Min.                   | Max.                  | Unit |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|------------------------|-----------------------|------|
| DC Current Gain <sup>Note1</sup><br>at $V_{CE} = 10\text{ V}$ , $I_C = 1\text{ mA}$<br>at $V_{CE} = 10\text{ V}$ , $I_C = 250\text{ mA}$<br>at $V_{CE} = 10\text{ V}$ , $I_C = 500\text{ mA}$<br>at $V_{CE} = 10\text{ V}$ , $I_C = 1\text{ A}$ | $H_{FE}$      | 100<br>100<br>60<br>20 | --<br>300<br>--<br>-- | --   |
| Collector Base Cutoff Current<br>at $V_{CB} = 100\text{ V}$                                                                                                                                                                                     | $I_{CBO}$     | --                     | 100                   | nA   |
| Emitter Base Cutoff Current<br>at $V_{EB} = 4\text{ V}$                                                                                                                                                                                         | $I_{EBO}$     | --                     | 100                   | nA   |
| Collector Base Breakdown Voltage<br>at $I_C = 100\text{ }\mu\text{A}$                                                                                                                                                                           | $V_{(BR)CBO}$ | 120                    | --                    | V    |
| Collector Emitter Breakdown Voltage<br>at $I_C = 1\text{ mA}$                                                                                                                                                                                   | $V_{(BR)CEO}$ | 100                    | --                    | V    |
| Emitter Base Breakdown Voltage<br>at $I_E = 100\text{ }\mu\text{A}$                                                                                                                                                                             | $V_{(BR)EBO}$ | 5                      | --                    | V    |
| Collector Emitter Saturation Voltage<br>at $I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$<br>at $I_C = 1\text{ A}$ , $I_B = 100\text{ mA}$                                                                                                        | $V_{CE(sat)}$ | --<br>--               | 300<br>600            | mV   |
| Base Emitter Saturation Voltage<br>at $I_C = 1\text{ A}$ , $I_B = 100\text{ mA}$                                                                                                                                                                | $V_{BE(sat)}$ | --                     | 1.15                  | V    |
| Base Emitter On Voltage<br>at $V_{CE} = 10\text{ V}$ , $I_C = 1\text{ A}$                                                                                                                                                                       | $V_{BE(on)}$  | --                     | 1                     | V    |
| Transition Frequency<br>at $V_{CE} = 10\text{ V}$ , $I_C = 50\text{ mA}$ , $f = 100\text{ MHz}$                                                                                                                                                 | $F_T$         | 150                    | --                    | MHz  |
| Output Capacitance<br>at $V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$                                                                                                                                                                            | $C_{ob}$      | --                     | 10                    | pF   |

RATING AND CHARACTERISTIC CURVES



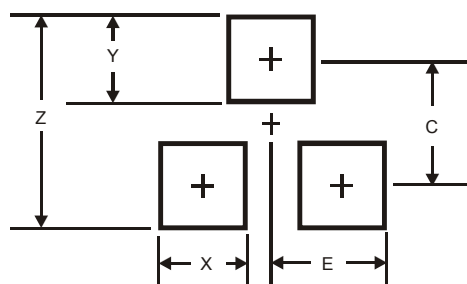
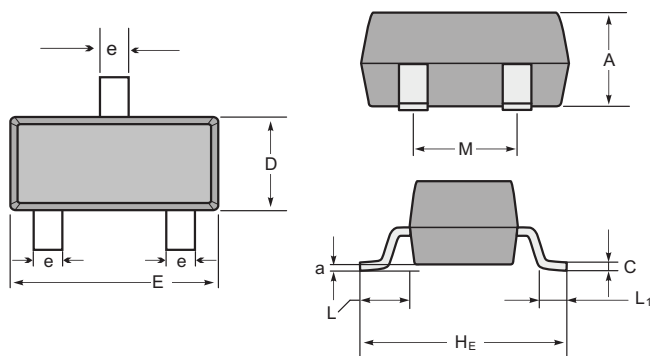
## Soldering parameters

| Reflow Condition                                        |                                   | Pb-Free assembly<br>(see as below) |
|---------------------------------------------------------|-----------------------------------|------------------------------------|
| Pre Heat                                                | -Temperature Min ( $T_{s(min)}$ ) | +150°C                             |
|                                                         | -Temperature Max( $T_{s(max)}$ )  | +200°C                             |
|                                                         | -Time (Min to Max) (ts)           | 60-180 secs.                       |
| Average ramp up rate (Liquid us Temp ( $T_L$ ) to peak) |                                   | 3°C/sec. Max                       |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                    |                                   | 3°C/sec. Max                       |
| Reflow                                                  | -Temperature( $T_L$ )(Liquid us)  | +217°C                             |
|                                                         | -Temperature( $t_L$ )             | 60-150 secs.                       |
| Peak Temp ( $T_P$ )                                     |                                   | +260(+0/-5)°C                      |
| Time within 5°C of actual Peak Temp ( $t_P$ )           |                                   | 30 secs. Max                       |
| Ramp-down Rate                                          |                                   | 6°C/sec. Max                       |
| Time 25°C to Peak Temp ( $T_P$ )                        |                                   | 8 min. Max                         |
| Do not exceed                                           |                                   | +260°C                             |



## Package Dimensions & Suggested Pad Layout

### SOT23



### SOT-23 mechanical data

| UNIT | A   | C   | D    | E   | H <sub>E</sub> | e   | M   | L    | L <sub>1</sub> | a          |
|------|-----|-----|------|-----|----------------|-----|-----|------|----------------|------------|
| mm   | max | 1.1 | 0.15 | 1.4 | 3.0            | 2.6 | 0.5 | 1.95 | 0.55 (ref)     | 0.36 (ref) |
|      | min | 0.9 | 0.08 | 1.2 | 2.8            | 2.2 | 0.3 | 1.7  |                | 0.15       |
| mil  | max | 43  | 6    | 55  | 118            | 102 | 20  | 77   | 22 (ref)       | 14 (ref)   |
|      | min | 35  | 3    | 47  | 110            | 87  | 12  | 67   |                | 6          |

| Dimensions | SOT23 |
|------------|-------|
| Z          | 2.9   |
| X          | 0.8   |
| Y          | 0.9   |
| C          | 2.0   |
| E          | 1.35  |

## Tape & reel specification

Technical drawing of a tape reel. The top view shows a rectangular tape with dimensions  $E$ ,  $F$ , and  $W$ . It features a series of circular holes with diameters  $\varnothing D0$  and  $\varnothing D1$ , and rectangular slots with widths  $P0$ ,  $P2$ , and  $P1$ . The side view, labeled "SECTION : B-B", shows the tape thickness  $T$ , the slot depth  $B0$ , and the slot width  $K0$ . A cross-section labeled "SECTION : A-A" shows the slot width  $A0$ .

| Symbol | Dimension (mm) |
|--------|----------------|
| P0     | 4.00±0.10      |
| P1     | 4.00±0.10      |
| P2     | 2.00±0.10      |
| D0     | 1.55±0.10      |
| D1     | 1.05±0.10      |
| E      | 1.55±0.10      |
| F      | 3.60±0.10      |
| W      | 8.00±0.10      |
| A0     | 3.80±0.20      |
| B0     | 3.25±0.20      |
| K0     | 1.45±0.10      |
| T      | 0.25±0.05      |
| D2     | 178.0±3.0      |
| D3     | 55Min.         |
| D4     | R24.0±3.0      |
| G      | R82.0±3.0      |
| I      | 13.0±2.0       |
| W1     | 11.0±3.0       |

Technical drawing of a 7 inch Reel. The top view shows a circular reel with dimensions  $D4$  and  $G$ . The side view shows the reel thickness  $D3$ , the reel diameter  $D2$ , and the reel width  $W1$ .

Quantity: 3000PCS