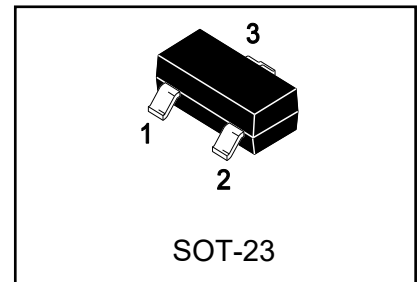


# High-Frequency Amplifier NPN Transistor

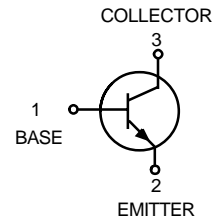
## • Features

- 1.High transition frequency.(Typ. $f_T=3.2\text{GHz}$ )
- 2.Small  $r_{bb}$  and high gain.(Typ.4ps)
- 3.Small NF.
- 4.We declare that the material of product compliance with RoHS requirements.
- 5.S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

**2SC3838**  
**S-2SC3838**



SOT-23



## MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Parameter                   | Symbol    | Value    | Unit             |
|-----------------------------|-----------|----------|------------------|
| Collector-Base Voltage      | $V_{CBO}$ | 20       | V                |
| Collector-Emitter Voltage   | $V_{CEO}$ | 11       | V                |
| Emitter-base voltage        | $V_{EBO}$ | 3        | V                |
| Collector Current           | $I_C$     | 50       | mA               |
| Collector power dissipation | $P_C$     | 0.2      | W                |
| Junction temperature        | $T_j$     | 150      | $^\circ\text{C}$ |
| Storage temperature         | $T_{sig}$ | -55~+150 | $^\circ\text{C}$ |

## DEVICE MARKING

2SC3838;S-2SC3838=AD

## • ORDERING INFORMATION

| Device               | Package | Shipping         |
|----------------------|---------|------------------|
| 2SC3838<br>S-2SC3838 | SOT-23  | 3000/Tape & Reel |

## ELECTRICAL CHARACTERISTICS( $T_A = 25^\circ\text{C}$ )

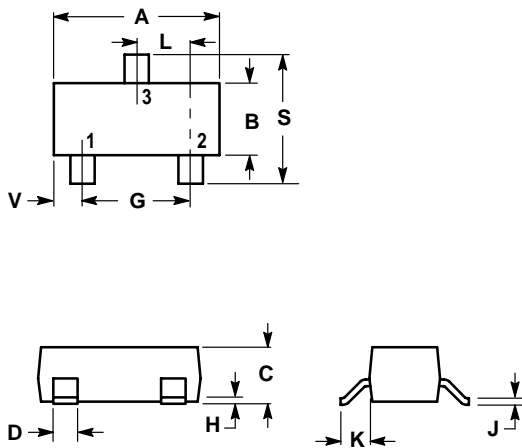
| Parameter                            | Symbol             | Min. | Typ | Max. | Unit          | Conditions   |
|--------------------------------------|--------------------|------|-----|------|---------------|--|
| Collector-base breakdown voltage     | $BV_{CBO}$         | 20   | -   | -    | V             | $I_C=10\mu\text{A}$  |
| Collector-emitter breakdown voltage  | $BV_{CEO}$         | 11   | -   | -    | V             | $I_C=1\text{mA}$   |
| Emitter-base breakdown voltage       | $BV_{EBO}$         | 3    | -   | -    | V             | $I_E=10\mu\text{A}$  |
| Collector cutoff current             | $I_{CBO}$          | -    | -   | 0.5  | $\mu\text{A}$ | $V_{CB}=10\text{V}$  |
| Emitter cutoff current               | $I_{EBO}$          | -    | -   | 0.5  | $\mu\text{A}$ | $V_{EB}=2\text{V}$   |
| Collector-emitter saturation voltage | $V_{CE(sat)}$      | -    | -   | 0.5  | V             | $I_C/I_B=10\text{mA}/5\text{mA}$   |
| DC current transfer ratio            | $h_{FE}$           | 56   | -   | 180  | -             | $V_{CE}/I_C=10\text{V}/5\text{mA}$   |
| Transition frequency                 | $f_T$              | 1.4  | 3.2 | -    | GHz           | $V_{CE}=10\text{V}$ , $I_E=-10\text{mA}$ , $f=500\text{MHz}$               |
| Output capacitance                   | $C_{ob}$           | -    | 0.8 | 1.5  | pF            | $V_{CB}=10\text{V}$ , $I_E=0\text{A}$ , $f=1\text{MHz}$                    |
| Collector-base time constant         | $r_{bb}$ and $C_c$ | -    | 4   | 12   | ps            | $V_{CB}=10\text{V}$ , $I_C=10\text{mA}$ , $f=31.8\text{MHz}$               |
| Noise factor                         | NF                 | -    | 3.5 | -    | dB            | $V_{CE}=6\text{V}$ , $I_C=2\text{mA}$ , $f=500\text{MHz}$ , $R_g=50\Omega$ |



**SOT-23**

**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M,1982
2. CONTROLLING DIMENSION: INCH.



| DIM | INCHES |        | MILLIMETERS |       |
|-----|--------|--------|-------------|-------|
|     | MIN    | MAX    | MIN         | MAX   |
| A   | 0.1102 | 0.1197 | 2.80        | 3.04  |
| B   | 0.0472 | 0.0551 | 1.20        | 1.40  |
| C   | 0.0350 | 0.0440 | 0.89        | 1.11  |
| D   | 0.0150 | 0.0200 | 0.37        | 0.50  |
| G   | 0.0701 | 0.0807 | 1.78        | 2.04  |
| H   | 0.0005 | 0.0040 | 0.013       | 0.100 |
| J   | 0.0034 | 0.0070 | 0.085       | 0.177 |
| K   | 0.0140 | 0.0285 | 0.35        | 0.69  |
| L   | 0.0350 | 0.0401 | 0.89        | 1.02  |
| S   | 0.0830 | 0.1039 | 2.10        | 2.64  |
| V   | 0.0177 | 0.0236 | 0.45        | 0.60  |

