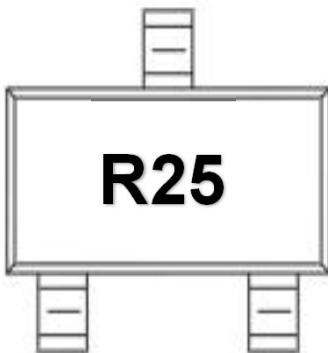
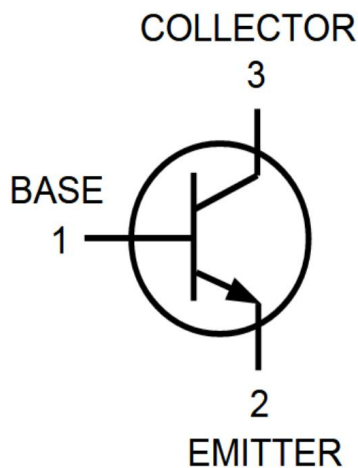


### TRANSISTOR (NPN)

#### MARKING:

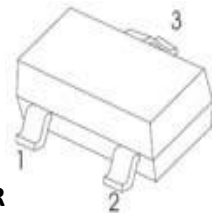


#### Equivalent Circuit:



#### SOT-23

- 1.BASE
- 2.EMITTER
- 3.COLLECTOR



#### FEATURES:

- ※ High transition frequency
- ※ Small  $r_{bb}' \cdot C_c$  and high gain.
- ※ Small NF.

#### ABSOLUTE MAXIMUM RATINGS (Ta=25°C unless otherwise noted)

| Parameter                                   | Symbol | Value    | Unit |
|---|--------|----------|------|
| Collector-Base Voltage                      | VCBO   | 20       | V    |
| Collector-Emitter Voltage                   | VCEO   | 11       | V    |
| Emitter-Base Voltage                        | VEBO   | 3        | V    |
| Collector Current                           | IC     | 50       | mA   |
| Collector Power Dissipation                 | PC     | 200      | mW   |
| Thermal Resistance From Junction To Ambient | RθJA   | 200      | °C/W |
| Junction Temperature                        | Tj     | 150      | °C   |
| Storage Temperature                         | Tstg   | -55~+150 | °C   |



# 2SC3838

SOT-23 Plastic-Encapsulate Transistors

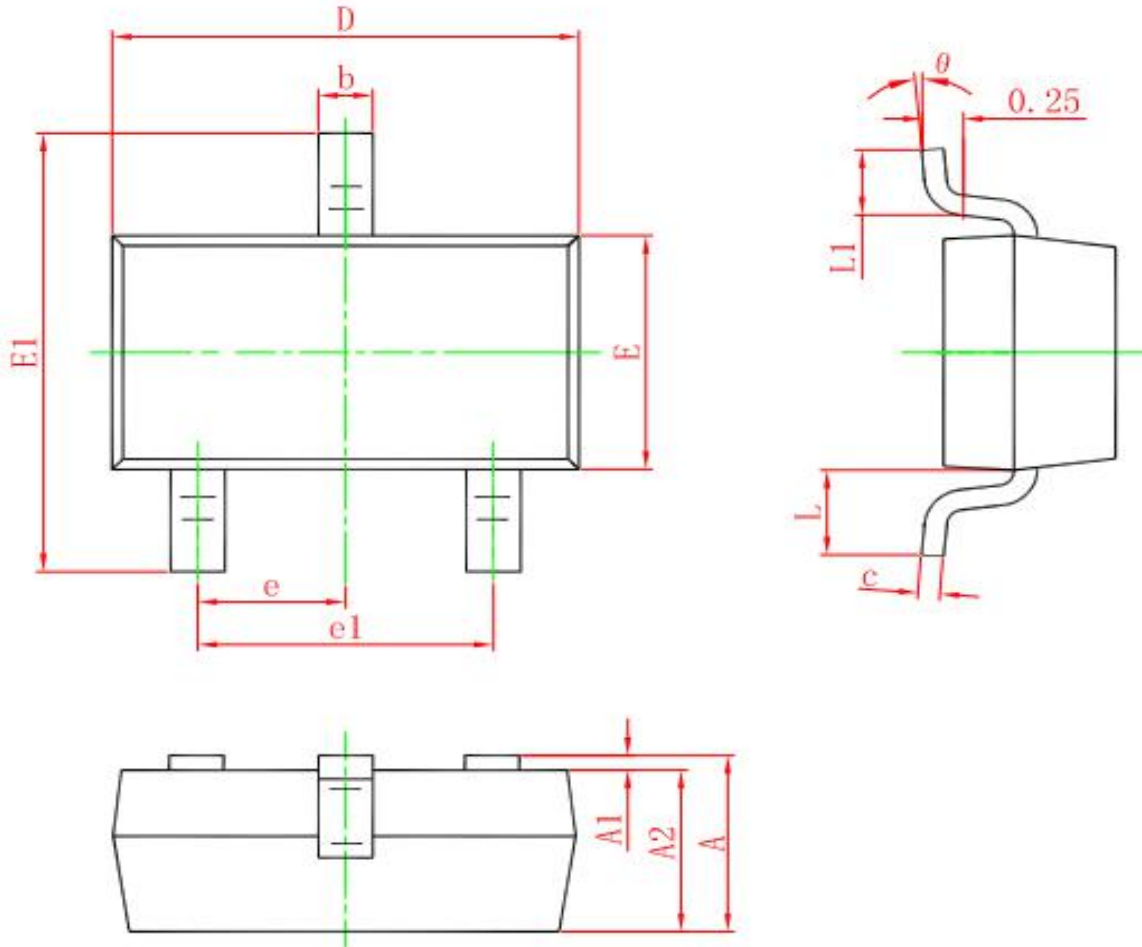
## ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

| Parameter                            | Symbol   | Test Condition                               | Min | Typ | Max | Unit |
|--------------------------------------|----------|--|-----|-----|-----|------|
| Collector-base breakdown voltage     | V(BR)CBO | IC= 100μA, IE=0                              | 20  |     |     | V    |
| Collector-emitter breakdown voltage  | V(BR)CEO | IC= 1mA, IB=0                                | 11  |     |     | V    |
| Emitter-base breakdown voltage       | V(BR)EBO | IE= 100μA, IC=0                              | 3   |     |     | V    |
| Collector cut-off current            | ICBO     | VCE= 20 V , IE=0                             |     |     | 0.5 | μA   |
| Emitter cut-off current              | IEBO     | VEB= 3V , IC=0                               |     |     | 0.5 | μA   |
| DC current gain                      | hFE      | VCE= 10V, IC= 5mA                            | 82  |     | 250 |      |
| Collector-emitter saturation voltage | VCE(sat) | IC= 10 mA, IB= 5mA                           |     |     | 0.5 | V    |
| Base-emitter saturation voltage      | VBE(sat) | IC= 10 mA, IB= 5mA                           |     |     | 1.2 | V    |
| Transition frequency                 | fT       | VCE=10V, IC= 10mA<br>f=500MHz,               | 1.4 | 3.2 |     | GHz  |
| Collector output capacitance         | Cob      | VCE = 10 V, IE = 0 mA,<br>f = 1 MHz          |     |     | 1.5 | PF   |
| Collector-base time constant         | rbb'.Cc  | VCE = 10 V, IC = 10 mA,<br>f=31.8 MHz,       |     | 4   | 12  | ps   |
| Noise figure                         | NF       | VCE = 6 V, IC = 2 mA,<br>f = 500MHz, Rg=50 Ω |     | 3.5 |     | dB   |

## CLASSIFICATION OF hFE

| TYPE    | 2SC3838-P | 2SC3838-Q | 2SC3838-Y |
|---------|-----------|-----------|-----------|
| Range   | 82-180    | 100-200   | 120-240   |
| MARKING | ADP       | ADQ       | ADY       |

### SOT-23 PACKAGE OUTLINE DIMENSIONS



| Symbol   | Dimensions In Millimeters |       | Dimensions In Inches |       |
|----------|---------------------------|-------|----------------------|-------|
|          | Min.                      | Max.  | Min.                 | Max.  |
| A        | 0.900                     | 1.150 | 0.035                | 0.045 |
| A1       | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2       | 0.900                     | 1.050 | 0.035                | 0.041 |
| b        | 0.300                     | 0.500 | 0.012                | 0.020 |
| c        | 0.080                     | 0.150 | 0.003                | 0.006 |
| D        | 2.800                     | 3.000 | 0.110                | 0.118 |
| E        | 1.200                     | 1.400 | 0.047                | 0.055 |
| E1       | 2.250                     | 2.550 | 0.089                | 0.100 |
| e        | 0.950 TYP.                |       | 0.037 TYP.           |       |
| e1       | 1.800                     | 2.000 | 0.071                | 0.079 |
| L        | 0.550 REF.                |       | 0.022 REF.           |       |
| L1       | 0.300                     | 0.500 | 0.012                | 0.020 |
| $\theta$ | 0°                        | 8°    | 0°                   | 8°    |