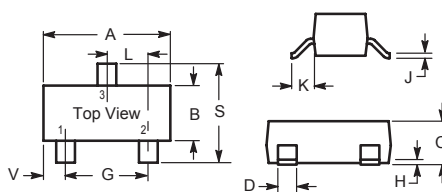
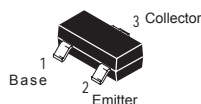


RoHS Compliant Product
A suffix of "-C" specifies halogen and lead free

FEATURES

- Power dissipation
 $P_{CM}: 0.2 \text{ W (} T_{AMB}=25^{\circ}\text{C)}$
- Collector current
 $I_{CM}: 0.1 \text{ A}$
- Collector-base voltage
 $V_{(BR)CBO}: 60 \text{ V}$
- Operating and storage junction temperature range
 $T_J, T_{STG}: -55^{\circ}\text{C to } +150^{\circ}\text{C}$



| SOT-23 | | |
|---------------------|-------|-------|
| Dim | Min | Max |
| A | 2.800 | 3.040 |
| B | 1.200 | 1.400 |
| C | 0.890 | 1.110 |
| D | 0.370 | 0.500 |
| G | 1.780 | 2.040 |
| H | 0.013 | 0.100 |
| J | 0.085 | 0.177 |
| K | 0.450 | 0.600 |
| L | 0.890 | 1.020 |
| S | 2.100 | 2.500 |
| V | 0.450 | 0.600 |
| All Dimension in mm | | |

ELECTRICAL CHARACTERISTICS at $T_A = 25^{\circ}\text{C}$

| PARAMETER | TEST CONDITIONS | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|--------------------------------------|--|---------------|------|------|------|---------------|
| Collector-Base Breakdown Voltage | $I_C = 10 \mu\text{A}, I_E = 0$ | $V_{(BR)CBO}$ | 60 | - | - | V |
| Collector-Emitter Breakdown Voltage | $I_C = 2 \text{ mA}, I_B = 0$ | $V_{(BR)CEO}$ | 50 | - | - | V |
| Emitter-Base Breakdown Voltage | $I_E = 10 \mu\text{A}, I_C = 0$ | $V_{(BR)EBO}$ | 7 | - | - | V |
| Collector Cut-off Current | $V_{CB} = 20\text{V}, I_E = 0$ | I_{CBO} | - | - | 0.1 | μA |
| Collector Cut-off Current | $V_{EB} = 10\text{V}, I_C = 0$ | I_{CEO} | - | - | 100 | μA |
| Collector-Emitter Saturation Voltage | $I_C = 100\text{mA}, I_B = 10\text{mA}$ | $V_{CE(sat)}$ | - | - | 0.3 | V |
| DC Current Gain | $V_{CE} = 10 \text{ V}, I_C = 2 \text{ mA}$ | $h_{FE(1)}$ | 160 | - | 460 | |
| | $V_{CE} = 2 \text{ V}, I_C = 100 \text{ mA}$ | $h_{FE(2)}$ | 90 | - | - | |
| Transition Frequency | $V_{CE} = 10\text{V}, I_C = 2\text{mA}, f = 200\text{MHz}$ | f_T | - | 150 | - | MHz |
| Collector Output Capacitance | $V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$ | C_{OB} | - | 3.5 | - | pF |

CLASSIFICATION OF $h_{FE(1)}$

| Rank | Q | R | S |
|---------|-----------|-----------|-----------|
| Range | 160 - 260 | 210 - 340 | 290 - 460 |
| Marking | ZQ | ZR | ZS |