SGS-THOMSON MICROELECTRONICS

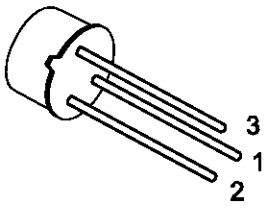
# BUY49S

## SILICON NPN TRANSISTOR

- SGS-THOMSON PREFERRED SALESTYPE
- NPN TRANSISTOR
- FAST SWITCHING SPEED
- LOW COLLECTOR EMITTER SATURATION

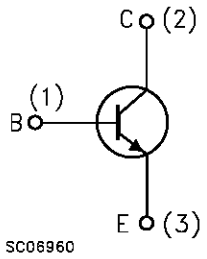
**APPLICATIONS**
- GENERAL PURPOSE SWITCHING

**DESCRIPTION**
The BUY49S is a silicon epitaxial planar NPN transistor in jedec TO-39 package. It is used in high-current switching applications up to 3 A.




**TO-39**

**INTERNAL SCHEMATIC DIAGRAM**




**ABSOLUTE MAXIMUM RATINGS**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage (IE = 0) | 250 | V |
| $V_{CEO}$ | Collector-Emitter Voltage ($I_B$ = 0) | 200 | V |
| $V_{EBO}$ | Emitter-Base Voltage (IC = 0) | 6 | V |
| $I_C$ | Collector Current | 3 | A |
| $I_{CM}$ | Collector Peak Current | 5 | A |
| $P_{tot}$ | Total Power Dissipation at $T_{amb} \leq 25\ ^oC$ | 10 | W |
| $T_{stg}$ | Storage Temperature | - 65 to 200 | $^oC$ |
| $T_j$ | Max Operating Junction Temperature | 200 | $^oC$ |

## THERMAL DATA

| | | | |
|---|---|---|---|
| $R_{thj\text{-}case}$ | Thermal Resistance Junction-case Max | 15 | $^oC/W$ |
| $R_{thj\text{-}amb}$ | Thermal Resistance Junction-case-ambient Max | 175 | $^oC/W$ |

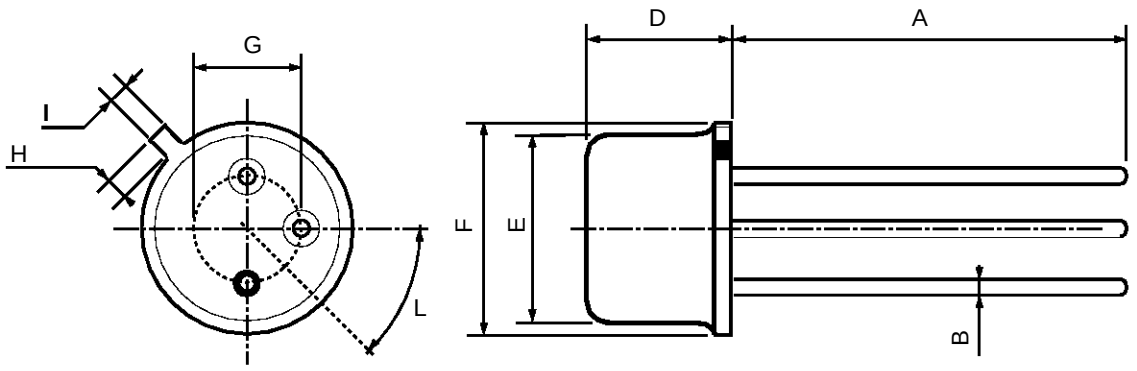
## ELECTRICAL CHARACTERISTICS ($T_{case}$ = 25 $^oC$ unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_{CBO}$ | Collector Cut-off Current ($I_E$ = 0 ) | $V_{CB}$ = 200 V<br>$V_{CB}$ = 200 V $T_{case}$ = 150 $^oC$ | | | 0.1<br>50 | µA<br>µA |
| $V_{(BR)CBO}$* | Collector-Base Breakdown Voltage ($I_E$ = 0 ) | $I_C$ = 100 µA | 250 | | | V |
| $V_{CEO(sus)}$* | Collector-Emitter Sustaining Voltage ($I_B$ = 0) | $I_C$ = 20 mA | 200 | | | V |
| $V_{EBO}$* | Emitter-base Voltage ($I_C$ = 0) | $I_E$ = 1 mA | 6 | | | V |
| $V_{CE(sat)}$* | Collector-Emitter Saturation Voltage | $I_C$ = 0.5 A $I_B$ = 50 mA | | | 0.2 | V |
| $V_{BE(sat)}$* | Collector-Emitter Saturation Voltage | $I_C$ = 0.5 A $I_B$ = 50 mA | | | 1.1 | V |
| $h_{FE}$* | DC Current Gain | $I_C$ = 20 mA $V_{CE}$ = 5 V<br>$I_C$ = 0.5 A $V_{CE}$ = 5 V<br>$I_C$ = 20 mA $V_{CE}$ = 2 V<br>$T_{case}$ = - 55 $^oC$ | 40<br>40<br>16 | 80 | | |
| $f_T$ | Transistor Frequency | $I_C$ = 100 mA $V_{CE}$ = 10 V | 50 | | | MHz |
| $C_{CBO}$ | Collector-base Capacitance | $I_E$ = 0 $V_{CB}$ = 10 V<br>f = 1 MHz | | | 30 | pF |
| $t_{on}$ | Turn-on Time | $I_C$ = 0.5 A $V_{CC}$ = 20 V | | | 0.3 | µs |
| $t_{off}$ | Turn-off Time | $I_{B1}$ = - $I_{B2}$ = 50 mA | | | 1 | µs |
| $I_{s/b}$** | Second Breakdown Collector Current | $V_{CE}$ = 50 V | 0.2 | | | A |

∗ Pulsed: Pulse duration = 300 µs, duty cycle = 1.5 %
∗∗ Pulsed: 1 s, non repetitive pulse.

## TO-39 MECHANICAL DATA

| DIM. | mm | | | inch | | |
|---|---|---|---|---|---|---|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 12.7 | | | 0.500 | | |
| B | | | 0.49 | | | 0.019 |
| D | | | 6.6 | | | 0.260 |
| E | | | 8.5 | | | 0.334 |
| F | | | 9.4 | | | 0.370 |
| G | 5.08 | | | 0.200 | | |
| H | | | 1.2 | | | 0.047 |
| I | | | 0.9 | | | 0.035 |
| L | $45^{o}$ (typ.) | | | | | |

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