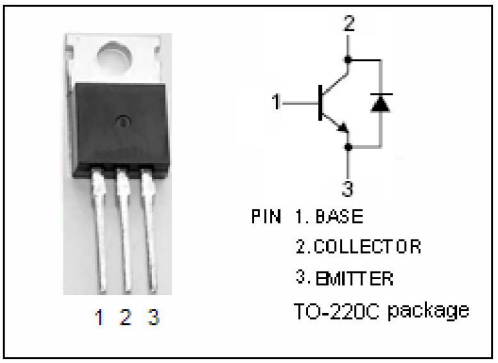
# isc Silicon NPN Power Transistor BUL39D

## DESCRIPTION

- Collector–Emitter Sustaining Voltage
  : $V_{CEO(SUS)}$ = 450V(Min.)
- Collector Saturation Voltage
  : $V_{CE(sat)}$ = 0.5V(Max) @ $I_C$= 1.0A
- Very High Switching Speed




## APPLICATIONS

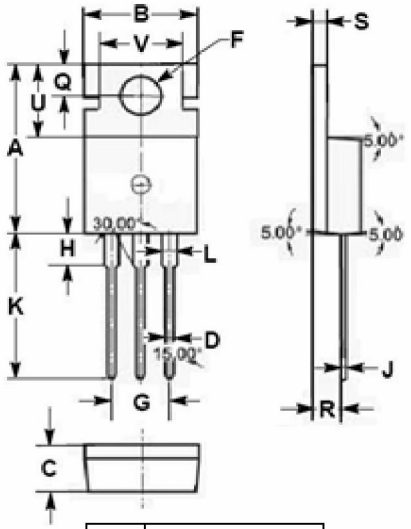
- Designed for use in lighting applications and low cost switch-mode power supplies

## ABSOLUTE MAXIMUM RATINGS($T_a$=25℃)

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $V_{CES}$ | Collector-Emitter Voltage | 850 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 450 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 9 | V |
| $I_C$ | Collector Current-Continuous | 4 | A |
| $I_{CM}$ | Collector Current-peak $t_p$<5ms | 8 | A |
| $I_B$ | Base Current-Continuous | 2 | A |
| $I_{BM}$ | Base Current-peak $t_p$<5ms | 4 | A |
| $P_C$ | Collector Power Dissipation $T_C$=25℃ | 70 | W |
| $T_j$ | Junction Temperature | 150 | ℃ |
| $T_{stg}$ | Storage Temperature Range | -65~150 | ℃ |

## THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | MAX | UNIT |
|---|---|---|---|
| $R_{th\ j\text{-}c}$ | Thermal Resistance,Junction to Case | 1.78 | ℃/W |
| $R_{th\ j\text{-}A}$ | Thermal Resistance,Junction to Ambient | 70 | ℃/W |




| DIM | mm MIN | MAX |
|---|---|---|
| A | 15.70 | 15.90 |
| B | 9.90 | 10.10 |
| C | 4.20 | 4.40 |
| D | 0.70 | 0.90 |
| F | 3.40 | 3.60 |
| G | 4.98 | 5.18 |
| H | 2.70 | 2.90 |
| J | 0.44 | 0.46 |
| K | 13.20 | 13.40 |
| L | 1.10 | 1.30 |
| Q | 2.70 | 2.90 |
| R | 2.50 | 2.70 |
| S | 1.29 | 1.31 |
| U | 6.45 | 6.65 |
| V | 8.66 | 8.86 |

# isc Silicon NPN Power Transistor BUL39D

## ELECTRICAL CHARACTERISTICS

**$T_C$ =25℃ unless otherwise specified**

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|
| $V_{CEO(SUS)}$ | Collector-Emitter Sustaining Voltage | $I_C$= 100mA; L= 25mH | 450 | | | V |
| $V_{CE(sat)-1}$ | Collector-Emitter Saturation Voltage | $I_C$= 1A; $I_B$= 0.2A | | | 0.5 | V |
| $V_{CE(sat)-2}$ | Collector-Emitter Saturation Voltage | $I_C$= 2.5A; $I_B$= 0.5A | | | 1.1 | V |
| $V_{BE(sat)-1}$ | Base-Emitter Saturation Voltage | $I_C$= 1A; $I_B$= 0.2A | | | 1.1 | V |
| $V_{BE(sat)-2}$ | Base-Emitter Saturation Voltage | $I_C$= 2.5A; $I_B$= 0.5A | | | 1.3 | V |
| $I_{CES}$ | Collector Cutoff Current | $V_{CE}$= 850V; $V_{BE}$= 0<br>$V_{CE}$= 850V; $V_{BE}$= 0, $T_C$= 125℃ | | | 0.1<br>0.5 | mA |
| $I_{EBO}$ | Emitter Cutoff Current | $V_{EB}$= 9V; $I_C$= 0 | | | 0.1 | mA |
| $h_{FE-1}$ | DC Current Gain | $I_C$= 5A; $V_{CE}$= 10V | 4 | | | |
| $h_{FE-2}$ | DC Current Gain | $I_C$= 10mA; $V_{CE}$= 5V | 10 | | | |
| $V_F$ | Diode Forward Voltage | $I_F$= 2A | | | 1.5 | V |
| Switching Times, Inductive Load | | | | | | |
| $t_s$ | Storage Time | $I_C$= 2.5A; $I_{B(on)}$= 0.5A; $V_{BE(off)}$= -5V<br>$V_{CL}$= 300V; $R_{BB}$= 0Ω; L= 1mH | | | 1.5 | μs |
| $t_f$ | Fall Time | | | | 0.1 | μs |