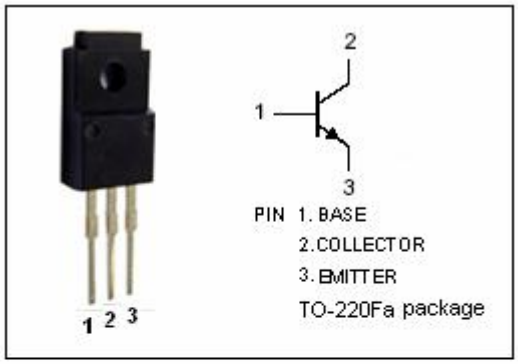
# isc Silicon NPN Power Transistor — BUL310XI

## DESCRIPTION

- Collector–Emitter Sustaining Voltage
  : $V_{CEO(SUS)}$ = 500V(Min.)
- Low Collector Saturation Voltage
  : $V_{CE(sat)}$ = 0.5V(Max) @ $I_C$= 1A
- High Switching Speed
- 100% avalanche tested
- Minimum Lot-to-Lot variations for robust device performance and reliable operation




## APPLICATIONS

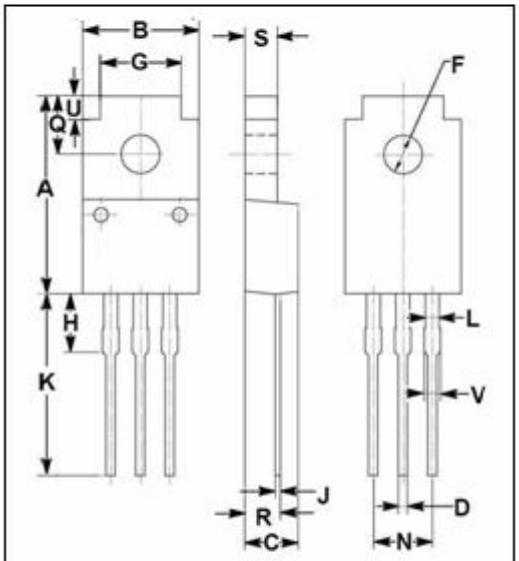
- Designed for use in lighting applications and low cost switch-mode power supplies.

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

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $V_{CES}$ | Collector-Emitter Voltage | 1000 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 500 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 9 | V |
| $I_C$ | Collector Current-Continuous | 5 | A |
| $I_{CM}$ | Collector Current-peak $t_p$<5ms | 10 | A |
| $I_B$ | Base Current-Continuous | 3 | A |
| $I_{BM}$ | Base Current-peak $t_p$<5ms | 4 | A |
| $P_C$ | Collector Power Dissipation $T_C$=25℃ | 36 | 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 | 3.5 | ℃/W |
| $R_{th\ j\text{-}A}$ | Thermal Resistance,Junction to Ambient | 62.5 | ℃/W |




| DIM | mm MIN | mm MAX |
|---|---|---|
| A | 16.85 | 17.15 |
| B | 9.54 | 10.10 |
| C | 4.35 | 4.65 |
| D | 0.75 | 0.90 |
| F | 3.20 | 3.40 |
| G | 6.90 | 7.20 |
| H | 5.15 | 5.45 |
| J | 0.45 | 0.75 |
| K | 13.35 | 13.65 |
| L | 1.10 | 1.30 |
| N | 4.98 | 5.18 |
| Q | 4.85 | 5.15 |
| R | 2.55 | 3.25 |
| S | 2.70 | 2.90 |
| U | 1.75 | 2.05 |
| V | 1.30 | 1.50 |

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## ELECTRICAL CHARACTERISTICS

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

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|
| $V_{CEO(SUS)}$ | Collector-Emitter Sustaining Voltage | $I_C$= 50mA;Ib=0 | 500 | | | V |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage | $I_E$= 10mA; $I_C$= 0 | 9 | | | 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 | $I_C$= 2A; $I_B$= 0.4A | | | 0.7 | V |
| $V_{CE(sat)-3}$ | Collector-Emitter Saturation Voltage | $I_C$= 3A; $I_B$= 0.6A | | | 1.1 | V |
| $V_{BE(sat)-1}$ | Base-Emitter Saturation Voltage | $I_C$= 1A; $I_B$= 0.2A | | | 1.0 | V |
| $V_{BE(sat)-2}$ | Base-Emitter Saturation Voltage | $I_C$= 2A; $I_B$= 0.4A | | | 1.1 | V |
| $V_{BE(sat)-3}$ | Base-Emitter Saturation Voltage | $I_C$= 3A; $I_B$= 0.6A | | | 1.2 | V |
| $I_{CES}$ | Collector Cutoff Current | $V_{CE}$=1000V; $V_{BE}$= 0<br>$V_{CE}$=1000V; $V_{BE}$= 0, $T_C$= 125℃ | | | 0.1<br>0.5 | mA |
| $I_{CEO}$ | Collector Cutoff Current | $V_{CE}$= 400V; $I_B$= 0 | | | 0.25 | mA |
| $h_{FE-1}$ | DC Current Gain | $I_C$= 10mA; $V_{CE}$= 5V | 10 | | | |
| $h_{FE-2}$ | DC Current Gain | $I_C$= 3A; $V_{CE}$= 2.5V | | 10 | | |
| Switching Times, Inductive Load | | | | | | |
| $t_s$ | Storage Time | $I_C$= 2A; $V_{CL}$= 250V; L= 200 μ H;<br>$I_{B1}$= 0.4A; $V_{BE(off)}$= -5V; $R_{BB}$= 0 Ω | | | 1.9 | μ s |
| $t_f$ | Fall Time | | | | 0.16 | μ s |

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