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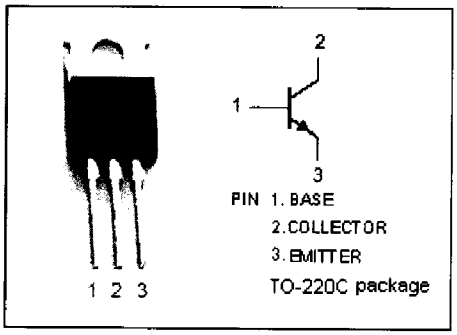
# Silicon NPN Power Transistor — 2N6833

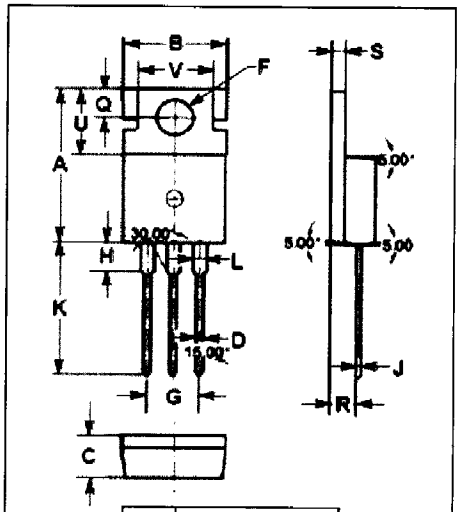
## DESCRIPTION

- Collector-Emitter Sustaining Voltage-
  : $V_{CEO(SUS)}$ = 450V(Min)
- High Switching Speed

## APPLICATIONS

- Designed for high-voltage ,high-speed, power switching in inductive circuits where fall time is critical. They are particularly suited for line operated switch-mode applications. Typical applications:
- Switching regulators
- Inverters
- Solenoid and relay drivers
- Motor controls
- Deflection circuits




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

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $V_{CEV}$ | Collector-Emitter Voltage | 850 | V |
| $V_{CEO(SUS)}$ | Collector-Emitter Voltage | 450 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 6 | V |
| $I_C$ | Collector Current-Continuous | 5 | A |
| $I_{CM}$ | Collector Current-Peak | 10 | A |
| $I_B$ | Base Current-Continuous | 4 | A |
| $I_{BM}$ | Base Current-Peak | 8 | A |
| $P_C$ | Collector Power Dissipation@$T_C$=25℃ | 80 | W |
| $T_J$ | Junction Temperature | 150 | ℃ |
| $T_{stg}$ | Storage Temperature | -65~150 | ℃ |

## THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | MAX | UNIT |
|---|---|---|---|
| $R_{th\ j\text{-}c}$ | Thermal Resistance,Junction to Case | 1.56 | ℃/W |

| DIM | mm MIN | mm 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 |

## 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 ; $I_B$=0 | 450 | | | V |
| $V_{CE(sat)-1}$ | Collector-Emitter Saturation Voltage | $I_C$= 1.5A; $I_B$= 0.15A | | | 1.0 | V |
| $V_{CE(sat)-2}$ | Collector-Emitter Saturation Voltage | $I_C$= 3A; $I_B$= 0.4A<br>$I_C$= 3A; $I_B$= 0.4A,$T_C$=100℃ | | | 2.5<br>2.5 | V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_C$= 3A; $I_B$= 0.4A<br>$I_C$= 3A; $I_B$= 0.4A,$T_C$=100℃ | | | 1.5<br>1.5 | V |
| $I_{CEV}$ | Collector Cutoff Current | $V_{CEV}$= 850V;$V_{BE(off)}$= 1.5V<br>$V_{CEV}$= 850V;$V_{BE(off)}$= 1.5V;$T_C$=100℃ | | | 0.25<br>1.5 | mA |
| $I_{CER}$ | Collector Cutoff Current | $V_{CE}$= 850V; $R_{BE}$= 50 Ω ,$T_C$= 100℃ | | | 2.5 | mA |
| $I_{EBO}$ | Emitter Cutoff Current | $V_{EB}$= 6.0V; $I_C$=0 | | | 1.0 | mA |
| $h_{FE-1}$ | DC Current Gain | $I_C$= 3A ; $V_{CE}$= 5V | 7.5 | | 30 | |
| $h_{FE-2}$ | DC Current Gain | $I_C$= 5A ; $V_{CE}$= 5V | 5 | | | |
| $f_T$ | Current Gain-Bandwidth Product | $I_C$= 0.25A ;$V_{CE}$= 10V; $f_{test}$=10MHz | 15 | | 75 | MHz |
| $C_{OB}$ | Output Capacitance | $I_E$= 0; $V_{CB}$= 10V; $f_{test}$=1.0kHz | 20 | | 200 | pF |

Switching times;Resistive Load

| | | | | | | |
|---|---|---|---|---|---|---|
| $t_d$ | Delay Time | $I_C$= 3A , $V_{CC}$= 250V;<br>$I_{B1}$= 0.4A; $I_{B2}$= -0.8A;<br>$P_W$= 30 μ s; $R_{B2}$= 8 Ω<br>Duty Cycle≤2.0% | | 0.03 | 0.1 | μ s |
| $t_r$ | Rise Time | | | 0.1 | 0.3 | μ s |
| $t_s$ | Storage Time | | | 1.0 | 3.0 | μ s |
| $t_f$ | Fall Time | | | 0.06 | 0.3 | μ s |