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# Silicon NPN Power Transistors

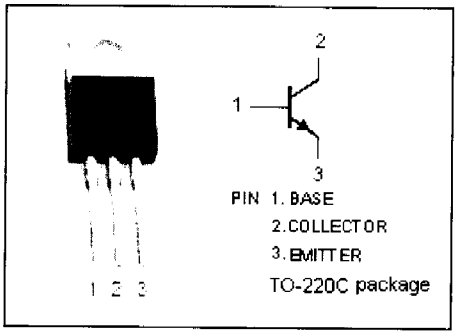
# MJE13070/13071

## DESCRIPTION

- Collector-Emitter Sustaining Voltage-
  : $V_{CEO(SUS)}$ = 400V(Min)- MJE13070
  = 450V(Min)- MJE13071
- Collector-Emitter Saturation Voltage-
  : $V_{CE(sat)}$ = 3.0V(Min)@$I_C$= 5A

## APPLICATIONS

- Designed for high-voltage, high-speed, power switching in inductive circuits, where fall time is critical. They are particularly suited for line-operated switchmode applications such as switching regulators , inverters , DC-DC converter, motor controls, solenoid drive and deflection circuits.

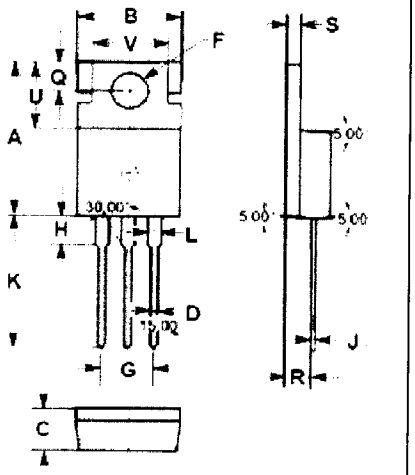



## ABSOLUTE MAXIMUM RATINGS($T_a$=25℃)

| SYMBOL | PARAMETER | | VALUE | UNIT |
|---|---|---|---|---|
| $V_{CEV}$ | Collector-Emitter Voltage | MJE13070 | 650 | V |
| | | MJE13071 | 750 | |
| $V_{CEO}$ | Collector-Emitter Voltage | MJE13070 | 400 | V |
| | | MJE13071 | 450 | |
| $V_{EBO}$ | Emitter-Base Voltage | | 6 | V |
| $I_C$ | Collector Current-Continuous | | 5 | A |
| $I_{CM}$ | Collector Current-Peak | | 8 | A |
| $I_B$ | Base Current | | 2 | A |
| $P_C$ | Collector Power Dissipation @ $T_C$=25℃ | | 80 | 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 | 1.56 | ℃/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 |

## ELECTRICAL CHARACTERISTICS

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

| SYMBOL | PARAMETER | | CONDITIONS | MIN | MAX | UNIT |
|---|---|---|---|---|---|---|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage | MJE13070 | $I_C$= 0.1A ;$I_B$= 0 | 400 | | V |
| | | MJE13071 | | 450 | | |
| $V_{CE(sat)-1}$ | Collector-Emitter Saturation Voltage | | $I_C$= 3A; $I_B$= 0.6A<br>$I_C$= 3A; $I_B$= 0.6A;$T_C$=100℃ | | 1.0<br>2.0 | V |
| $V_{CE(sat)-2}$ | Collector-Emitter Saturation Voltage | | $I_C$= 5A; $I_B$= 1A | | 3.0 | V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | | $I_C$= 3A; $I_B$= 0.6A<br>$I_C$= 3A; $I_B$= 0.6A;$T_C$=100℃ | | 1.5<br>1.5 | V |
| $I_{CEV}$ | Collector Cutoff Current | | $V_{CEV}$=Rated Value;$V_{BE(off)}$= 1.5V<br>$V_{CEV}$=Rated Value;$V_{BE(off)}$=1.5V;$T_C$=100℃ | | 0.5<br>2.5 | mA |
| $I_{EBO}$ | Emitter Cutoff Current | | $V_{EB}$= 6V; $I_C$=0 | | 1.0 | mA |
| $h_{FE}$ | DC Current Gain | | $I_C$= 3A ; $V_{CE}$= 5V | 8 | | |
| $C_{OB}$ | Output Capacitance | | $I_E$= 0; $V_{CB}$= 10V, $f_{test}$= 1.0kHz | | 250 | pF |

Switching Times

| | | | | | |
|---|---|---|---|---|---|
| $t_d$ | Delay Time | $I_C$= 3A; $I_{B1}$= 0.4A;$V_{BE(off)}$= 5V;<br>$V_{CC}$= 250V; $t_p$= 30 μ s,Duty Cycle≤1% | | 0.05 | μ s |
| $t_r$ | Rise Time | | | 0.4 | μ s |
| $t_{stg}$ | Storage Time | | | 1.5 | μ s |
| $t_f$ | Fall Time | | | 0.5 | μ s |