

isc Silicon NPN Power Transistor

MJ8500

DESCRIPTION

- Collector-Emitter Sustaining Voltage-  
:  $V_{CEO(SUS)} = 700V(\text{Min})$
- High Switching Speed

APPLICATIONS

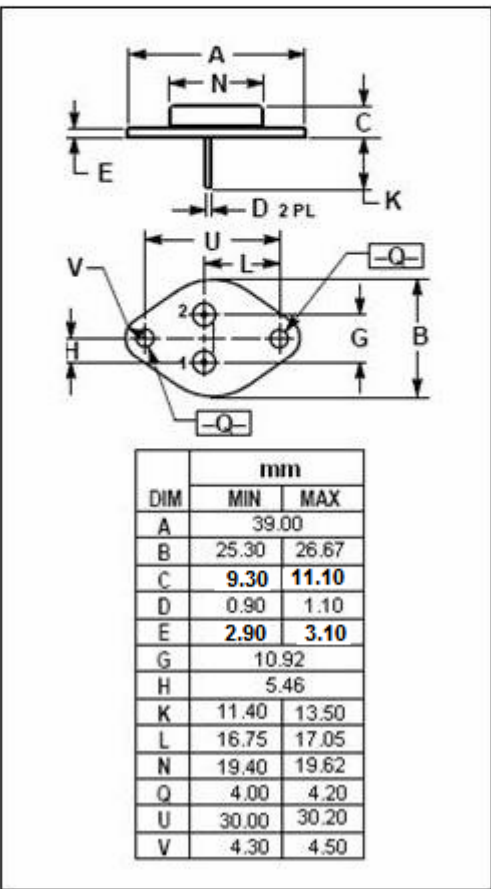
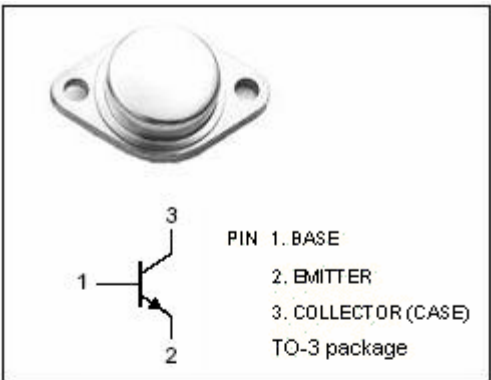
- Designed for high-voltage ,high-speed, power switching in inductive circuits where fall time is critical. They are particularly suited for line operated switch-mode applications.  
Typical applications:
- Switching regulators
- Inverters
- Solenoid and relay drivers
- Motor controls
- Deflection circuits

ABSOLUTE MAXIMUM RATINGS( $T_a=25^{\circ}\text{C}$ )

| SYMBOL         | PARAMETER                                             | VALUE   | UNIT               |
|----------------|-------------------------------------------------------|---------|--------------------|
| $V_{CEV}$      | Collector-Emitter Voltage                             | 1200    | V                  |
| $V_{CEO(SUS)}$ | Collector-Emitter Voltage                             | 700     | V                  |
| $V_{EBO}$      | Emitter-Base Voltage                                  | 8       | V                  |
| $I_C$          | Collector Current-Continuous                          | 2.5     | A                  |
| $I_{CM}$       | Collector Current-Peak                                | 5       | A                  |
| $I_B$          | Base Current-Continuous                               | 2       | A                  |
| $I_{BM}$       | Base Current-Peak                                     | 4       | A                  |
| $P_C$          | Collector Power Dissipation@ $T_C=25^{\circ}\text{C}$ | 125     | W                  |
| $T_J$          | Junction Temperature                                  | 200     | $^{\circ}\text{C}$ |
| $T_{stg}$      | Storage Temperature                                   | -65~200 | $^{\circ}\text{C}$ |

THERMAL CHARACTERISTICS

| SYMBOL        | PARAMETER                           | MAX | UNIT                 |
|---------------|-------------------------------------|-----|----------------------|
| $R_{th\ j-c}$ | Thermal Resistance,Junction to Case | 1.4 | $^{\circ}\text{C/W}$ |



**isc Silicon NPN Power Transistor****MJ8500****ELECTRICAL CHARACTERISTICS** $T_C=25^{\circ}\text{C}$  unless otherwise specified

| SYMBOL          | PARAMETER                            | CONDITIONS                                                                                                                           | MIN | TYP. | MAX         | UNIT |
|-----------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-----|------|-------------|------|
| $V_{CEO(SUS)}$  | Collector-Emitter Sustaining Voltage | $I_C=100\text{mA}$ ; $I_B=0$                                                                                                         | 700 |      |             | V    |
| $V_{CE(sat)-1}$ | Collector-Emitter Saturation Voltage | $I_C=1\text{A}$ ; $I_B=0.33\text{A}$<br>$I_C=1\text{A}$ ; $I_B=0.33\text{A}$ , $T_C=100^{\circ}\text{C}$                             |     |      | 2.0<br>3.0  | V    |
| $V_{CE(sat)-2}$ | Collector-Emitter Saturation Voltage | $I_C=2.5\text{A}$ ; $I_B=1\text{A}$                                                                                                  |     |      | 5.0         | V    |
| $V_{BE(sat)}$   | Base-Emitter Saturation Voltage      | $I_C=1\text{A}$ ; $I_B=0.33\text{A}$<br>$I_C=1\text{A}$ ; $I_B=0.33\text{A}$ , $T_C=100^{\circ}\text{C}$                             |     |      | 1.5<br>1.5  | V    |
| $I_{CEV}$       | Collector Cutoff Current             | $V_{CEV}=1200\text{V}$ ; $V_{BE(off)}=1.5\text{V}$<br>$V_{CEV}=1200\text{V}$ ; $V_{BE(off)}=1.5\text{V}$ ; $T_C=150^{\circ}\text{C}$ |     |      | 0.25<br>5.0 | mA   |
| $I_{CER}$       | Collector Cutoff Current             | $V_{CE}=1200\text{V}$ ; $R_{BE}=50\Omega$ , $T_C=100^{\circ}\text{C}$                                                                |     |      | 5.0         | mA   |
| $I_{EBO}$       | Emitter Cutoff Current               | $V_{EB}=7.0\text{V}$ ; $I_C=0$                                                                                                       |     |      | 1.0         | mA   |
| $h_{FE}$        | DC Current Gain                      | $I_C=0.5\text{A}$ ; $V_{CE}=5\text{V}$                                                                                               | 7.5 |      |             |      |
| $C_{OB}$        | Output Capacitance                   | $I_E=0$ ; $V_{CB}=10\text{V}$ ; $f_{test}=1.0\text{kHz}$                                                                             | 50  |      | 250         | pF   |

Switching times;Resistive Load

|       |              |                                                                                                                                              |  |      |      |    |
|-------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------|--|------|------|----|
| $t_d$ | Delay Time   | $I_C=1\text{A}$ , $V_{CC}=500\text{V}$ ;<br>$I_{B1}=0.33\text{A}$ ; $t_p=50\mu\text{s}$ ; $V_{BE(off)}=5\text{V}$<br>Duty Cycle $\leq 2.0\%$ |  | 45   | 200  | ns |
| $t_r$ | Rise Time    |                                                                                                                                              |  | 200  | 2000 | ns |
| $t_s$ | Storage Time |                                                                                                                                              |  | 1000 | 4000 | ns |
| $t_f$ | Fall Time    |                                                                                                                                              |  | 500  | 2000 | ns |