

**Silicon NPN Power Transistor**

**2N6933/34/35**

**DESCRIPTION**

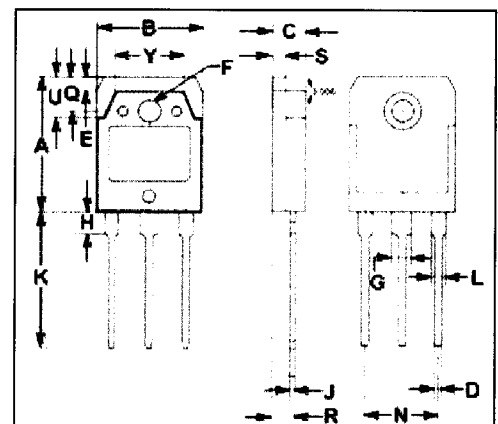
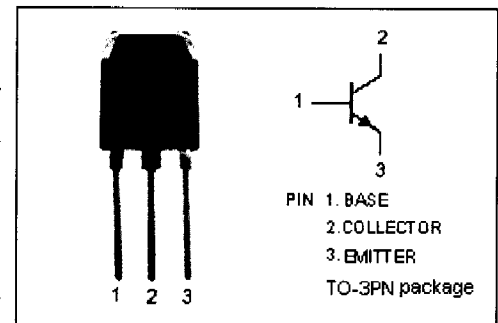
- High Switching Speed
- High Voltage

**APPLICATIONS**

- Off-line power supplies
- High voltage inverters
- Switching regulators

**ABSOLUTE MAXIMUM RATINGS(T<sub>a</sub>=25°C)**

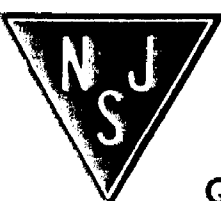
| SYMBOL           | PARAMETER   | VALUE   | UNIT |
|------------------|---|---------|------|
| V <sub>CEV</sub> | Collector-Emitter Voltage (V <sub>BE</sub> = -1.5V) | 2N6933  | 450  |
|                  |   | 2N6934  | 550  |
|                  |   | 2N6935  | 650  |
| V <sub>CEX</sub> | Collector-Emitter Voltage                           | 2N6933  | 350  |
|                  |   | 2N6934  | 400  |
|                  |   | 2N6935  | 450  |
| V <sub>CEO</sub> | Collector-Emitter Voltage                           | 2N6933  | 300  |
|                  |   | 2N6934  | 350  |
|                  |   | 2N6935  | 400  |
| V <sub>EBO</sub> | Emitter-Base Voltage                                | 8       | V    |
| I <sub>C</sub>   | Collector Current-Continuous                        | 15      | A    |
| I <sub>CM</sub>  | Collector Current-Peak                              | 23      | A    |
| I <sub>B</sub>   | Base Current-Continuous                             | 5       | A    |
| I <sub>BM</sub>  | Base Current-Peak                                   | 7       | A    |
| I <sub>E</sub>   | Emitter Current-Continuous                          | 20      | A    |
| I <sub>EM</sub>  | Emitter Current-Peak                                | 30      | A    |
| P <sub>C</sub>   | Collector Power Dissipation @ T <sub>C</sub> =25°C  | 175     | W    |
| T <sub>J</sub>   | Junction Temperature                                | 150     | °C   |
| T <sub>stg</sub> | Storage Temperature Range                           | -65~150 | °C   |



| DIM | mm    |       |
|-----|-------|-------|
|     | MIN   | MAX   |
| A   | 19.90 | 20.10 |
| B   | 15.50 | 15.70 |
| C   | 4.70  | 4.90  |
| D   | 0.90  | 1.10  |
| E   | 1.90  | 2.10  |
| F   | 3.40  | 3.60  |
| G   | 2.90  | 3.10  |
| H   | 3.20  | 3.40  |
| J   | 0.595 | 0.605 |
| K   | 20.50 | 20.70 |
| L   | 1.90  | 2.10  |
| N   | 10.89 | 10.91 |
| Q   | 4.90  | 5.10  |
| R   | 3.35  | 3.45  |
| S   | 1.995 | 2.005 |
| U   | 5.90  | 6.10  |
| Y   | 9.90  | 10.10 |

**THERMAL CHARACTERISTICS**

| SYMBOL              | PARAMETER                            | MAX  | UNIT |
|---------------------|--------------------------------------|------|------|
| R <sub>th-j-c</sub> | Thermal Resistance, Junction to Case | 0.71 | °C/W |



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## ELECTRICAL CHARACTERISTICS

$T_C=25^\circ\text{C}$  unless otherwise specified

| SYMBOL         | PARAMETER                            | CONDITIONS  | MIN | MAX        | UNIT |
|----------------|--------------------------------------|---|-----|------------|------|
| $V_{CEO(SUS)}$ | Collector-Emitter Sustaining Voltage | 2N6933  | 300 |            | V    |
|                |                                      | 2N6934  | 350 |            |      |
|                |                                      | 2N6935  | 400 |            |      |
|                |                                      | $I_C=0.2A; L=25mH$  |     |            |      |
| $V_{(BR)EBO}$  | Emitter-Base Breakdown Voltage       | $I_E=50mA; I_C=0$   | 8   |            | V    |
| $V_{CE(sat)}$  | Collector-Emitter Saturation Voltage | $I_C=15A; I_B=3A$<br>$I_C=15A; I_B=3A; T_C=100^\circ\text{C}$                           |     | 1.0<br>2.0 | V    |
| $V_{BE(sat)}$  | Base-Emitter Saturation Voltage      | $I_C=15A; I_B=3A$<br>$I_C=15A; I_B=3A; T_C=100^\circ\text{C}$                           |     | 1.5<br>1.5 | V    |
| $I_{CEV}$      | Collector Cutoff Current             | $V_{CE}=V_{CEV}; V_{BE}=-1.5V$<br>$V_{CE}=V_{CEV}; V_{BE}=-1.5V; T_C=100^\circ\text{C}$ |     | 0.1<br>1.0 | mA   |
| $I_{EBO}$      | Emitter Cutoff Current               | $V_{EB}=8V; I_C=0$  |     | 2.0        | mA   |
| $h_{FE}$       | DC Current Gain                      | $I_C=15A; V_{CE}=3V$  | 8   | 35         |      |
| $C_{OB}$       | Output Capacitance                   | $I_E=0; V_{CB}=10V; f_{test}=1.0MHz$  | 150 |            | pF   |

### Switching Times; Resistive Load

|       |              |   |  |     |         |
|-------|--------------|---|--|-----|---------|
| $t_d$ | Delay Time   | $I_C=15A; I_{B1}=-I_{B2}=3A; R_L=20\Omega;$<br>$V_{BB}=-5V; V_{CC}=300V; t_p=30\mu s$ |  | 0.1 | $\mu s$ |
| $t_r$ | Rise Time    |   |  | 0.7 | $\mu s$ |
| $t_s$ | Storage Time |   |  | 2.5 | $\mu s$ |
| $t_f$ | Fall Time    |   |  | 0.5 | $\mu s$ |