

**DESCRIPTION**

- High breakdown voltage
- High switching speed
- High current capability
- Minimum Lot-to-Lot variations for robust device performance and reliable operation

**APPLICATIONS**

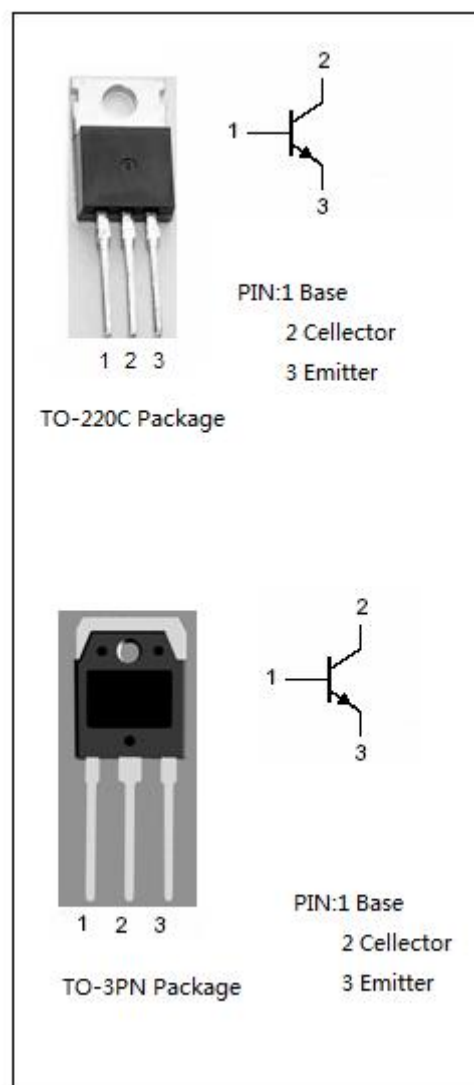
- Energy-saving light
- High frequency switching power supply
- High frequency power transform

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

| SYMBOL    | PARAMETER                                               |        | VALUE   | UNIT               |
|-----------|---------------------------------------------------------|--------|---------|--------------------|
| $V_{CEV}$ | Collector-Emitter Voltage                               |        | 700     | V                  |
| $V_{CEO}$ | Collector-Emitter Voltage                               |        | 400     | V                  |
| $V_{EBO}$ | Emitter-Base Voltage                                    |        | 9       | V                  |
| $I_C$     | Collector Current-Continuous                            |        | 12      | A                  |
| $I_{CM}$  | Collector Current-peak                                  |        | 24      | A                  |
| $I_B$     | Base Current                                            |        | 6       | A                  |
| $I_{BM}$  | Base Current-Peak                                       |        | 12      | A                  |
| $P_C$     | Collector Power Dissipation<br>$T_C=25^{\circ}\text{C}$ | TO-220 | 100     | W                  |
|           |                                                         | TO-3PN | 120     |                    |
| $T_j$     | Junction Temperature                                    |        | 150     | $^{\circ}\text{C}$ |
| $T_{stg}$ | Storage Temperature Range                               |        | -55~150 | $^{\circ}\text{C}$ |

**THERMAL CHARACTERISTICS**

| SYMBOL        | PARAMETER                               |        | MAX  | UNIT                 |
|---------------|-----------------------------------------|--------|------|----------------------|
| $R_{th\ j-c}$ | Thermal Resistance,<br>Junction to Case | TO-220 | 1.25 | $^{\circ}\text{C/W}$ |
|               |                                         | TO-3PN | 1.05 |                      |



## isc Silicon NPN Power Transistor

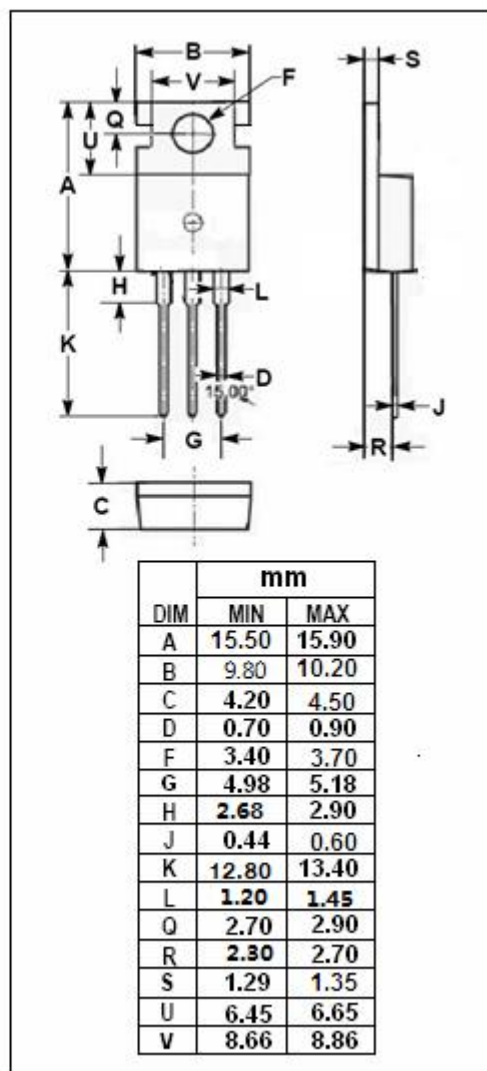
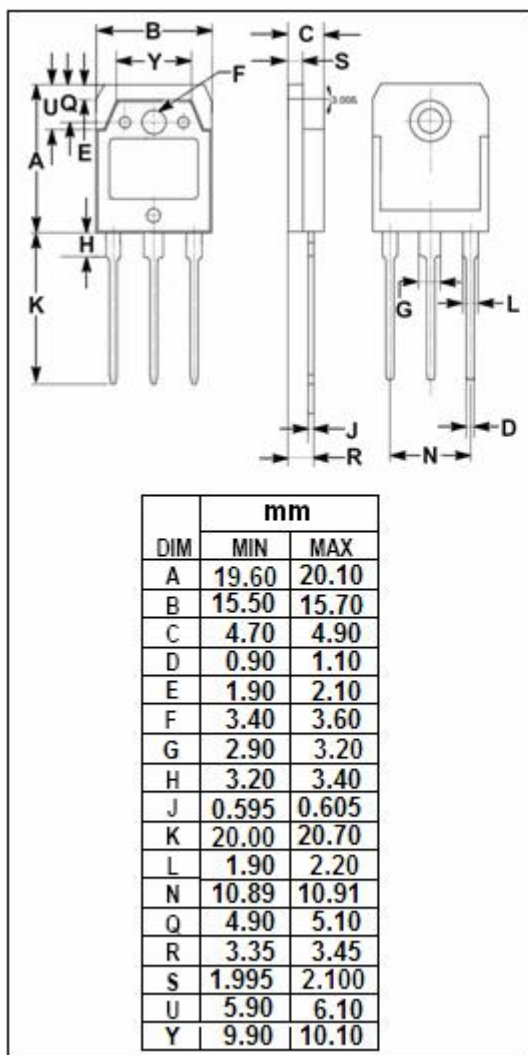
3DD13009N

## 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 | $I_C = 10\text{mA}; I_B = 0$          | 400 |      |      | V    |
| $V_{CE(sat)}$  | Collector-Emitter Saturation Voltage | $I_C = 8\text{A}; I_B = 1.6\text{A}$  |     |      | 1.5  | V    |
| $V_{BE(sat)}$  | Base-Emitter Saturation Voltage      | $I_C = 8\text{A}; I_B = 1.6\text{A}$  |     |      | 1.6  | V    |
| $I_{CBO}$      | Collector Cutoff Current             | $V_{CB} = 700\text{V}; I_E = 0$       |     |      | 0.1  | mA   |
| $I_{EBO}$      | Emitter Cutoff Current               | $V_{EB} = 10\text{V}; I_C = 0$        |     |      | 0.01 | mA   |
| $h_{FE-1}$     | DC Current Gain                      | $I_C = 5\text{A}; V_{CE} = 5\text{V}$ | 8   |      | 40   |      |
| $h_{FE-2}$     | DC Current Gain                      | $I_C = 8\text{A}; V_{CE} = 5\text{V}$ | 8   |      |      |      |

## Outline Drawing



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