

**isc Silicon NPN Power Transistor**

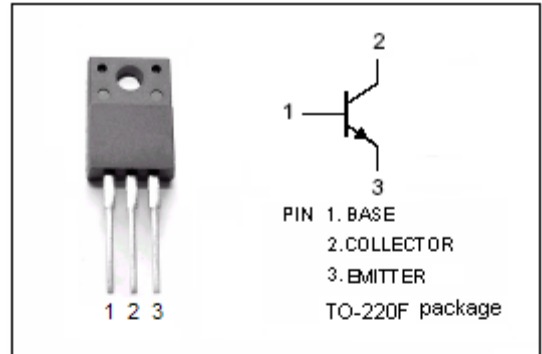
**BUT211X**

**DESCRIPTION**

- Collector-Emitter Sustaining Voltage-  
:  $V_{CEO(SUS)} = 400V(\text{Min.})$
- High Speed Switching

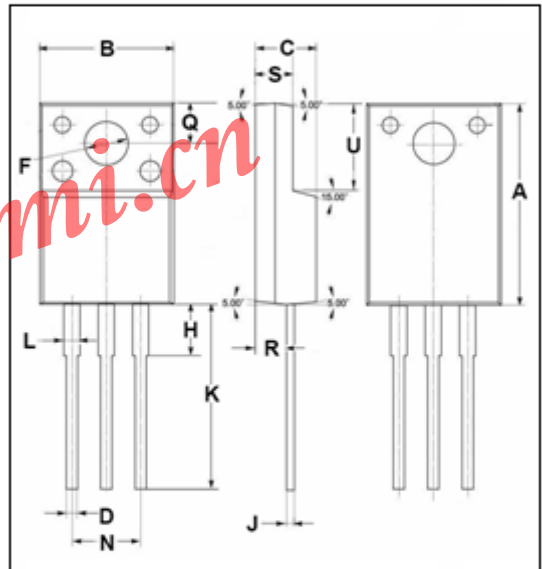
**APPLICATIONS**

- Designed for high frequency electronic lighting ballast applications.



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

| SYMBOL    | PARAMETER   | VALUE   | UNIT             |
|-----------|---|---------|------------------|
| $V_{CBO}$ | Collector-Base Voltage                                  | 850     | V                |
| $V_{CEO}$ | Collector-Emitter Voltage                               | 400     | V                |
| $V_{EBO}$ | Emitter-Base Voltage                                    | 9       | V                |
| $I_C$     | Collector Current-Continuous                            | 5       | A                |
| $I_{CM}$  | Collector Current-Peak                                  | 10      | A                |
| $I_B$     | Base Current-Continuous                                 | 2       | A                |
| $I_{BM}$  | Base Current-peak                                       | 4       | A                |
| $P_C$     | Collector Power Dissipation<br>@ $T_c=25^\circ\text{C}$ | 32      | W                |
| $T_j$     | Junction Temperature                                    | 150     | $^\circ\text{C}$ |
| $T_{stg}$ | Storage Temperature Range                               | -65~150 | $^\circ\text{C}$ |



| DIM | mm    |       |
|-----|-------|-------|
|     | MIN   | MAX   |
| A   | 14.95 | 15.05 |
| B   | 10.00 | 10.10 |
| C   | 4.40  | 4.60  |
| D   | 0.75  | 0.80  |
| F   | 3.10  | 3.30  |
| H   | 3.70  | 3.90  |
| J   | 0.50  | 0.70  |
| K   | 13.4  | 13.6  |
| L   | 1.10  | 1.30  |
| N   | 5.00  | 5.20  |
| Q   | 2.70  | 2.90  |
| R   | 2.20  | 2.40  |
| S   | 2.65  | 2.85  |
| U   | 6.40  | 6.60  |

**THERMAL CHARACTERISTICS**

| SYMBOL        | PARAMETER                            | MAX  | UNIT               |
|---------------|--------------------------------------|------|--------------------|
| $R_{th\ j-c}$ | Thermal Resistance, Junction to Case | 3.95 | $^\circ\text{C/W}$ |

## isc Silicon NPN Power Transistor

## BUT211X

## 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 | $I_C=0.1\text{A}; I_B=0; L=25\text{mH}$   | 400 |      |            | V    |
| $V_{CE(sat)}$  | Collector-Emitter Saturation Voltage | $I_C=3\text{A}; I_B=0.4\text{A}$  |     |      | 2.0        | V    |
| $V_{BE(sat)}$  | Base-Emitter Saturation Voltage      | $I_C=3\text{A}; I_B=0.4\text{A}$  |     |      | 1.3        | V    |
| $I_{CES}$      | Collector Cutoff Current             | $V_{CE}=850\text{V}; V_{BE}=0$<br>$V_{CE}=850\text{V}; V_{BE}=0; T_j=125^{\circ}\text{C}$ |     |      | 1.0<br>2.0 | mA   |
| $I_{EBO}$      | Emitter Cutoff Current               | $V_{EB}=9\text{V}; I_C=0$   |     |      | 10         | mA   |
| $h_{FE-1}$     | DC Current Gain                      | $I_C=1\text{A}; V_{CE}=2\text{V}$   | 13  |      | 30         |      |
| $h_{FE-2}$     | DC Current Gain                      | $I_C=3\text{A}; V_{CE}=2\text{V}$   | 7.5 |      |            |      |

Switching Times; Resistive Load

|       |              |  |  |  |     |               |
|-------|--------------|--|--|--|-----|---------------|
| $t_s$ | Storage Time | $I_C=3\text{A}; I_{B1}=0.3\text{A}; I_{B2}=-0.6\text{A}$ |  |  | 2.0 | $\mu\text{s}$ |
| $t_f$ | Fall Time    |  |  |  | 0.8 | $\mu\text{s}$ |

◆  $h_{FE-1}$  Classifications

|       |       |       |
|-------|-------|-------|
| 1     | 2     | 3     |
| 13-20 | 18-25 | 23-30 |