

isc Silicon NPN Power Transistor

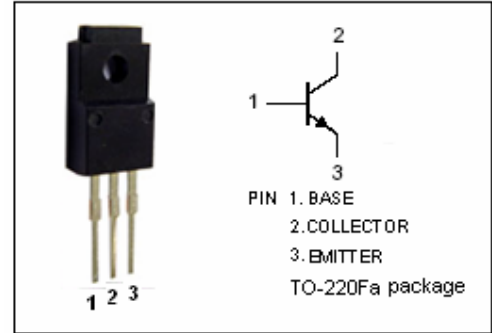
BU306F/307F

DESCRIPTION

- Collector-Emitter Sustaining Voltage-
: $V_{CEO(SUS)} = 300V(\text{Min})$ - BU306F
400V(Min)- BU307F
- Collector Current-8A

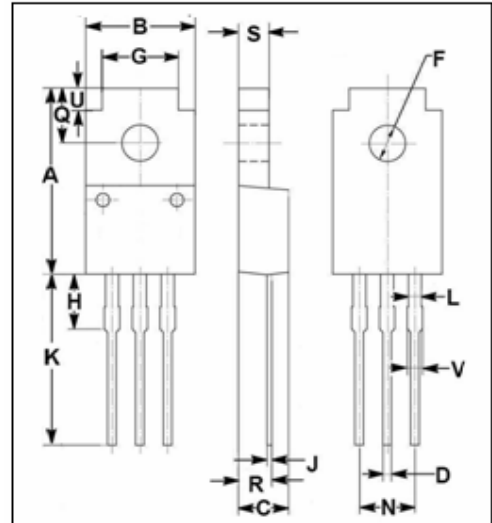
APPLICATIONS

- Designed for use in switching regulators, inverters, motor controls, solenoid/relay drivers and deflection circuits.



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

| SYMBOL | PARAMETER | VALUE | UNIT | |
|-----------|--|---------|------------------|---|
| V_{CBO} | Collector-Base Voltage | BU306F | 600 | V |
| | | BU307F | 700 | |
| V_{CEO} | Collector-Emitter Voltage | BU306F | 300 | V |
| | | BU307F | 400 | |
| V_{EBO} | Emitter-Base Voltage | 9 | V | |
| I_C | Collector Current-Continuous | 8 | A | |
| I_{CM} | Collector Current-Peak | 16 | A | |
| I_B | Base Current | 4 | A | |
| I_{BM} | Base Current-Peak | 8 | A | |
| P_C | Collector Power Dissipation @ $T_C=25^\circ\text{C}$ | 20 | W | |
| T_J | Junction Temperature | 150 | $^\circ\text{C}$ | |
| T_{stg} | Storage Temperature Range | -65~150 | $^\circ\text{C}$ | |



| DIM | mm | |
|-----|-------|-------|
| | MIN | MAX |
| A | 16.85 | 17.15 |
| B | 9.90 | 10.10 |
| C | 4.35 | 4.65 |
| D | 0.75 | 0.80 |
| F | 3.20 | 3.40 |
| G | 6.90 | 7.10 |
| H | 5.15 | 5.45 |
| J | 0.45 | 0.75 |
| K | 13.35 | 13.65 |
| L | 1.10 | 1.30 |
| N | 4.98 | 5.18 |
| Q | 4.85 | 5.15 |
| R | 2.95 | 3.25 |
| S | 2.70 | 2.90 |
| U | 1.75 | 2.05 |
| V | 1.30 | 1.50 |

THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | MAX | UNIT |
|---------------|--------------------------------------|------|---------------------------|
| $R_{th\ j-c}$ | Thermal Resistance, Junction to Case | 6.12 | $^\circ\text{C}/\text{W}$ |

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ELECTRICAL CHARACTERISTICS

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

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP. | MAX | UNIT |
|-----------------|--------------------------------------|---|-----|------|------------|------|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage | $I_C=0.1\text{A}; I_B=0; L=25\text{mH}$ | 300 | | | V |
| | | | 400 | | | |
| $V_{CE(sat)-1}$ | Collector-Emitter Saturation Voltage | $I_C=2\text{A}; I_B=0.4\text{A}$ | | | 1.0 | V |
| $V_{CE(sat)-2}$ | Collector-Emitter Saturation Voltage | $I_C=5\text{A}; I_B=1\text{A}$ $I_C=5\text{A}; I_B=1\text{A}; T_J=100^{\circ}\text{C}$ | | | 1.5 2.0 | V |
| $V_{CE(sat)-3}$ | Collector-Emitter Saturation Voltage | $I_C=8\text{A}; I_B=2\text{A}$ | | | 3.0 | V |
| $V_{BE(sat)-1}$ | Base-Emitter Saturation Voltage | $I_C=2\text{A}; I_B=0.4\text{A}$ | | | 1.2 | V |
| $V_{BE(sat)-2}$ | Base-Emitter Saturation Voltage | $I_C=5\text{A}; I_B=1\text{A}$ $I_C=5\text{A}; I_B=1\text{A}; T_J=100^{\circ}\text{C}$ | | | 1.6 1.5 | V |
| I_{CES} | Collector Cutoff Current | $V_{CE}=V_{CESmax}; V_{BE}=-1.5\text{V}$ $V_{CE}=V_{CESmax}; V_{BE}=-1.5\text{V}; T_J=100^{\circ}\text{C}$ | | | 1 5 | mA |
| I_{EBO} | Emitter Cutoff Current | $V_{EB}=9\text{V}; I_C=0$ | | | 1 | mA |
| h_{FE-1} | DC Current Gain | $I_C=0.5\text{A}; V_{CE}=5\text{V}$ | 15 | | 50 | |
| h_{FE-2} | DC Current Gain | $I_C=2\text{A}; V_{CE}=5\text{V}$ | 8 | | 40 | |
| h_{FE-3} | DC Current Gain | $I_C=5\text{A}; V_{CE}=5\text{V}$ | 6 | | 30 | |
| C_{OB} | Output Capacitance | $I_E=0; V_{CB}=10\text{V}$ | | 80 | | pF |
| f_T | Current-Gain—Bandwidth Product | $I_C=0.5\text{A}; V_{CE}=10\text{V}; f_{test}=1.0\text{MHz}$ | | 4 | | MHz |

Switching Times ; Resistive Load

| | | | | | | |
|-------|--------------|---|--|-----|-----|---------------|
| t_d | Delay Time | $I_C=5\text{A}; I_{B1}=-I_{B2}=1\text{A};$ $V_{CC}=125\text{V}; t_p=25\mu\text{s}$ | | | 0.1 | μs |
| t_r | Rise Time | | | | 1.0 | μs |
| t_s | Storage Time | | | 3.0 | | μs |
| t_f | Fall Time | | | | 0.7 | μs |