

isc Silicon NPN Power Transistors

TIP31E

DESCRIPTION

- DC Current Gain  $-h_{FE} = 25(\text{Min})@ I_C = 1\text{A}$
- Collector-Emitter Breakdown Voltage-  
:  $V_{(BR)CEO} = 140\text{V}(\text{Min})$
- Complement to Type TIP32E

APPLICATIONS

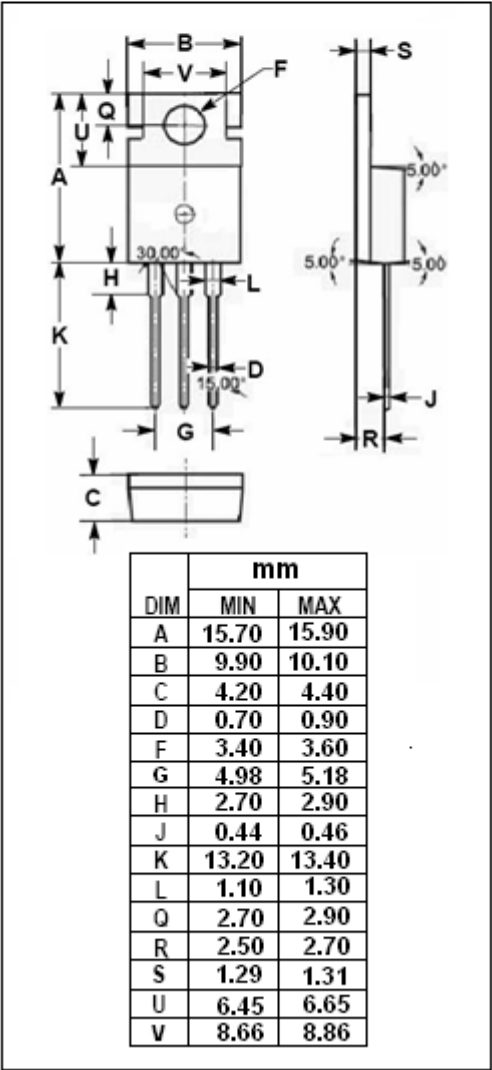
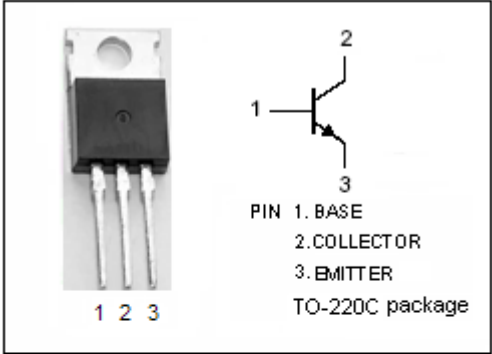
- Designed for use in general purpose amplifier and switching applications.

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

| SYMBOL    | PARAMETER                                               | VALUE   | UNIT               |
|-----------|---------------------------------------------------------|---------|--------------------|
| $V_{CBO}$ | Collector-Base Voltage                                  | 180     | V                  |
| $V_{CEO}$ | Collector-Emitter Voltage                               | 140     | V                  |
| $V_{EBO}$ | Emitter-Base Voltage                                    | 5       | V                  |
| $I_C$     | Collector Current-Continuous                            | 3       | A                  |
| $I_{CM}$  | Collector Current-Pulse                                 | 5       | A                  |
| $I_B$     | Base Current                                            | 1       | A                  |
| $P_C$     | Collector Power Dissipation<br>$T_C=25^{\circ}\text{C}$ | 40      | W                  |
| $T_j$     | Junction Temperature                                    | 150     | $^{\circ}\text{C}$ |
| $T_{stg}$ | Storage Ttemperature Range                              | -65~150 | $^{\circ}\text{C}$ |

THERMAL CHARACTERISTICS

| SYMBOL        | PARAMETER                            | MAX   | UNIT                 |
|---------------|--------------------------------------|-------|----------------------|
| $R_{th\ j-c}$ | Thermal Resistance, Junction to Case | 3.125 | $^{\circ}\text{C/W}$ |



**isc Silicon NPN Power Transistors****TIP31E****ELECTRICAL CHARACTERISTICS** $T_C=25^{\circ}\text{C}$  unless otherwise specified

| SYMBOL        | PARAMETER                            | CONDITIONS                           | MIN | MAX | UNIT |
|---------------|--------------------------------------|--------------------------------------|-----|-----|------|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage  | $I_C=30\text{mA}; I_B=0$             | 140 |     | V    |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C=3\text{A}; I_B=0.75\text{A}$    |     | 2.5 | V    |
| $V_{BE(on)}$  | Base-Emitter On Voltage              | $I_C=3\text{A}; V_{CE}=4\text{V}$    |     | 1.8 | V    |
| $I_{CES}$     | Collector Cutoff Current             | $V_{CE}=180\text{V}; V_{EB}=0$       |     | 0.2 | mA   |
| $I_{CEO}$     | Collector Cutoff Current             | $V_{CE}=90\text{V}; I_B=0$           |     | 0.3 | mA   |
| $I_{EBO}$     | Emitter Cutoff Current               | $V_{EB}=5\text{V}; I_C=0$            |     | 1.0 | mA   |
| $h_{FE-1}$    | DC Current Gain                      | $I_C=1\text{A}; V_{CE}=4\text{V}$    | 25  |     |      |
| $h_{FE-2}$    | DC Current Gain                      | $I_C=3\text{A}; V_{CE}=4\text{V}$    | 5   |     |      |
| $f_T$         | Current-Gain—Bandwidth Product       | $I_C=0.5\text{A}; V_{CE}=10\text{V}$ | 3   |     | MHz  |