

Silicon NPN Power Transistors

TIP31/31A/31B/31C

DESCRIPTION

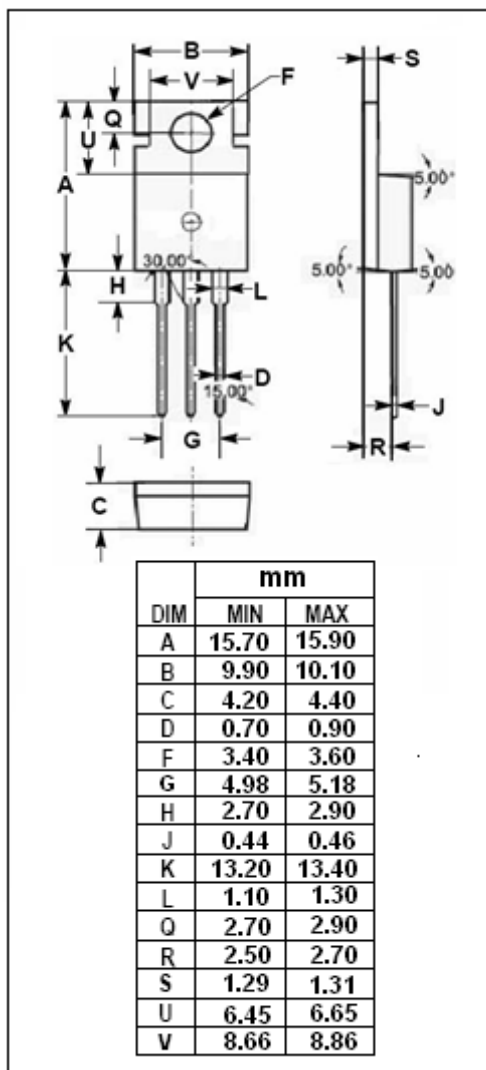
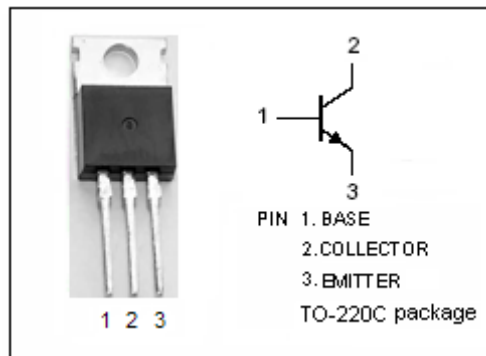
- DC Current Gain $-h_{FE} = 25(\text{Min}) @ I_C = 1.0\text{A}$
- Collector-Emitter Sustaining Voltage-
: $V_{CEO(\text{SUS})} = 40\text{V}(\text{Min})$ - TIP31; $60\text{V}(\text{Min})$ - TIP31A
 $80\text{V}(\text{Min})$ - TIP31B; $100\text{V}(\text{Min})$ - TIP31C
- Complement to Type TIP32/32A/32B/32C

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 | TIP31 | 40 | V |
| | | TIP31A | 60 | |
| | | TIP31B | 80 | |
| | | TIP31C | 100 | |
| V_{CEO} | Collector-Emitter Voltage | TIP31 | 40 | V |
| | | TIP31A | 60 | |
| | | TIP31B | 80 | |
| | | TIP31C | 100 | |
| 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 $T_C=25^\circ\text{C}$ | 40 | W | |
| | Collector Power Dissipation $T_a=25^\circ\text{C}$ | 2 | | |
| T_j | Junction Temperature | 150 | $^\circ\text{C}$ | |
| T_{stg} | Storage Temperature Range | -65~150 | $^\circ\text{C}$ | |



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ELECTRICAL CHARACTERISTICS

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

| SYMBOL | PARAMETER | CONDITIONS | MIN | MAX | UNIT | |
|---------------|--------------------------------------|--------------------------------------|--------------------------|-----|------|-------------------------------|
| $V_{CE(SUS)}$ | Collector-Emitter Sustaining Voltage | TIP31 | $I_C=30\text{mA}; I_B=0$ | 40 | V | |
| | | TIP31A | | 60 | | |
| | | TIP31B | | 80 | | |
| | | TIP31C | | 100 | | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C=3\text{A}; I_B=0.375\text{A}$ | | 1.2 | 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 | TIP31 | | 0.2 | mA | |
| | | TIP31A | | | | $V_{CE}=40\text{V}; V_{EB}=0$ |
| | | TIP31B | | | | $V_{CE}=60\text{V}; V_{EB}=0$ |
| | | TIP31C | | | | $V_{CE}=80\text{V}; V_{EB}=0$ |
| I_{CEO} | Collector Cutoff Current | TIP31/31A | | 0.3 | mA | |
| | | TIP31B/31C | | | | $V_{CE}=30\text{V}; I_B=0$ |
| 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 | $I_C=3\text{A}; V_{CE}=4\text{V}$ | 10 | 50 | | |
| f_T | Current-Gain—Bandwidth Product | $I_C=0.5\text{A}; V_{CE}=10\text{V}$ | 3 | | MHz | |

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