

Silicon NPN Power Transistors

TIP31/31A/31B/31C

DESCRIPTION

- With TO-220C package
- Complement to type TIP32/32A/32B/32C

APPLICATIONS

- Medium power linear switching applications

PINNING

| PIN | DESCRIPTION |
|-----|--------------------------------------|
| 1 | Base |
| 2 | Collector;connected to mounting base |
| 3 | Emitter |

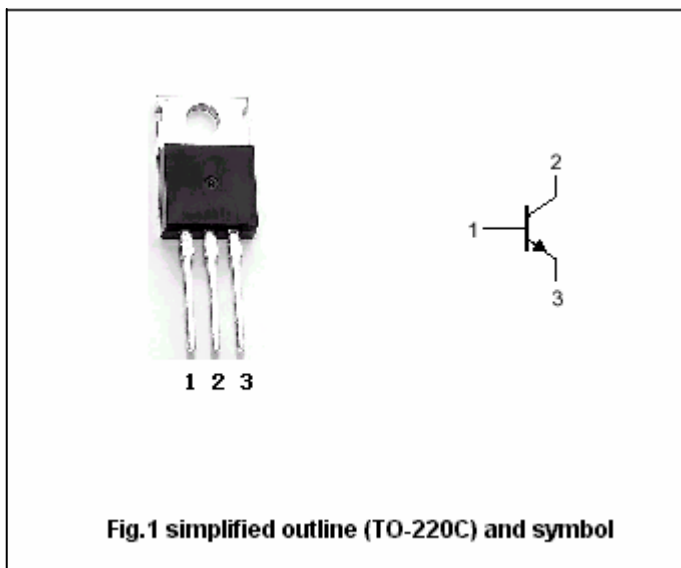


Fig.1 simplified outline (TO-220C) and symbol

Absolute maximum ratings(Ta=25)

| SYMBOL | PARAMETER | CONDITIONS | 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 | Open collector | 5 | V |
| I _C | Collector current (DC) | | 3 | A |
| I _{CM} | Collector current-Pulse | | 5 | A |
| I _B | Base current | | 1 | A |
| P _C | Collector power dissipation | T _C =25 | 40 | w |
| | | T _a =25 | 2 | |
| T _j | Junction temperature | | 150 | |
| T _{stg} | Storage temperature | | -65~150 | |

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CHARACTERISTICS

T_j=25 unless otherwise specified

| SYMBOL | PARAMETER | | CONDITIONS | MIN | TYP. | MAX | UNIT |
|-----------------------|--------------------------------------|------------|---|-----|------|-----|------|
| V _{CEO(SUS)} | Collector-emitter sustaining voltage | TIP31 | I _C =30mA; I _B =0 | 40 | | | V |
| | | TIP31A | | 60 | | | |
| | | TIP31B | | 80 | | | |
| | | TIP31C | | 100 | | | |
| V _{CEsat} | Collector-emitter saturation voltage | | I _C =3A I _B =0.375A | | | 1.2 | V |
| V _{BE} | Base-emitter on voltage | | I _C =3A ; V _{CE} =4V | | | 1.8 | V |
| I _{CES} | Collector cut-off current | TIP31 | V _{CE} =40V; V _{EB} =0 | | | 0.2 | mA |
| | | TIP31A | V _{CE} =60V; V _{EB} =0 | | | | |
| | | TIP31B | V _{CE} =80V; V _{EB} =0 | | | | |
| | | TIP31C | V _{CE} =100V; V _{EB} =0 | | | | |
| I _{CEO} | Collector cut-off current | TIP31/31A | V _{CE} =30V; I _B =0 | | | 0.3 | mA |
| | | TIP31B/31C | V _{CE} =60V; I _B =0 | | | | |
| I _{EBO} | Emitter cut-off current | | V _{EB} =5V; I _C =0 | | | 1.0 | mA |
| h _{FE-1} | DC current gain | | I _C =1A ; V _{CE} =4V | 25 | | | |
| h _{FE-2} | DC current gain | | I _C =3A ; V _{CE} =4V | 10 | | 50 | |
| f _T | Transiton frequency | | I _C =0.5A ; V _{CE} =10V | 3 | | | MHz |

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PACKAGE OUTLINE

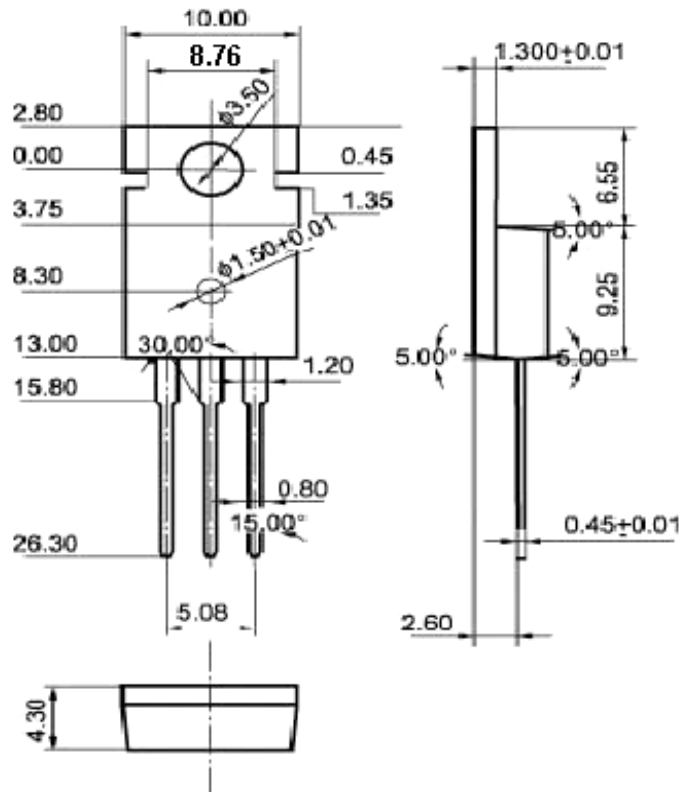


Fig.2 Outline dimensions (unindicated tolerance: ± 0.10 mm)

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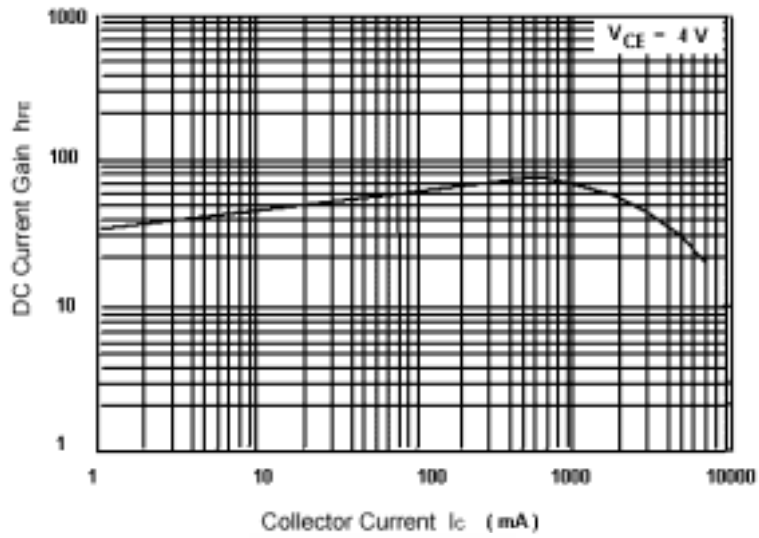


Fig.3 DC current Gain

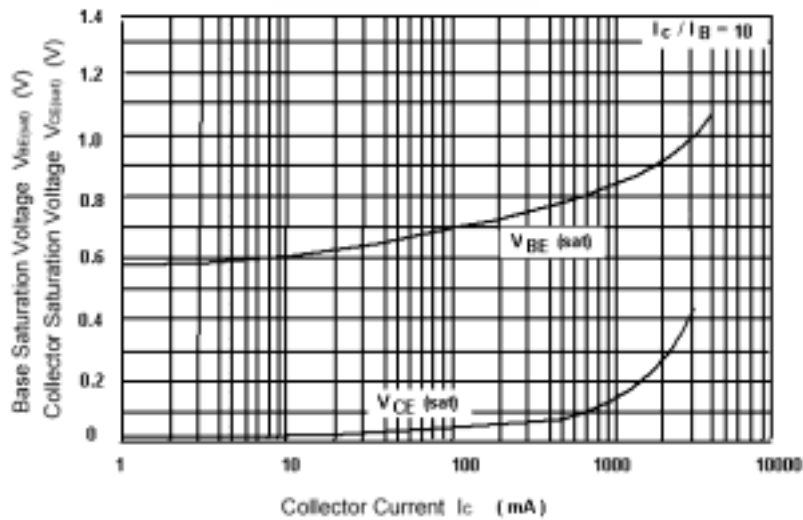


Fig.4 Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

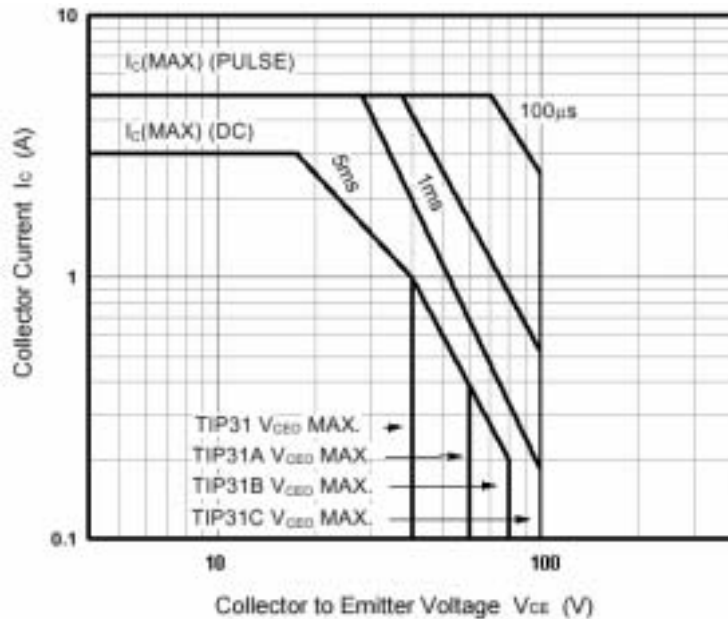


Fig.5 Safe Operating Area