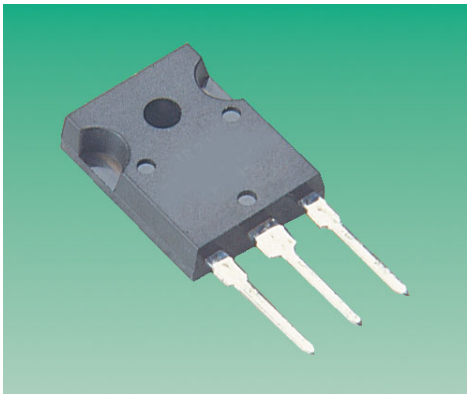
# TIP35C, 36C

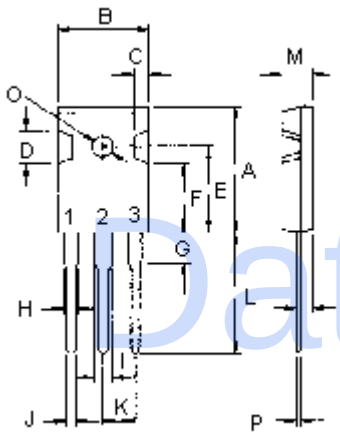
## Complementary Power Transistors



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

### Features:

- Collector-Emitter Sustaining Voltage
  $V_{CEO(sus)}$ = 100V (Minimum) - TIP35C, TIP36C
- DC Current Gain $h_{FE}$ = 25 (Minimum) at $I_C$ = 1.5A.
- Current Gain-Bandwidth Product $f_T$ = 3.0MHz (Minimum) at $I_C$ = 1.0A.




Pin 1. Base
2. Collector
3. Emitter

| Dimensions | Minimum | Maximum |
|---|---|---|
| A | 20.63 | 22.38 |
| B | 15.38 | 16.20 |
| C | 1.90 | 2.70 |
| D | 5.10 | 6.10 |
| E | 14.81 | 15.22 |
| F | 11.72 | 12.84 |
| G | 4.20 | 4.50 |
| H | 1.82 | 2.46 |
| I | 2.92 | 3.23 |
| J | 0.89 | 1.53 |
| K | 5.26 | 5.66 |
| L | 18.50 | 21.50 |
| M | 4.68 | 5.36 |
| N | 2.40 | 2.80 |
| O | 3.25 | 3.65 |
| P | 0.55 | 0.70 |

Dimensions : Millimetres

| NPN TIP35C | PNP TIP36C |
|---|---|

25 Ampere
Complementary Silicon
Power Transistors
100 Volts
125 Watts

**TO-247(3P)**



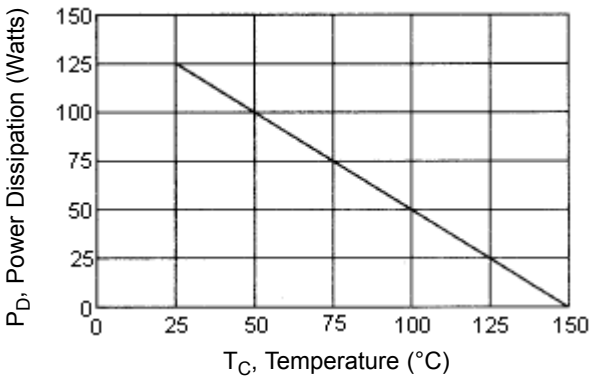
### Maximum Ratings

| Characteristic | Symbol | Rating | Unit |
|---|---|---|---|
| Collector-Emitter Voltage | $V_{CEO}$ | 100 | V |
| Collector-Base Voltage | $V_{CBO}$ | | |
| Emitter-Base Voltage | $V_{EBO}$ | 5.0 | |
| Collector Current-Continuous<br>-Peak | $I_C$ | 25<br>40 | A |
| Base Current | $I_B$ | 5.0 | |
| Total Power Dissipation at $T_C$ = 25°C<br>Derate above 25°C | $P_D$ | 125<br>1.0 | W<br>W/°C |
| Operating and Storage Junction Temperature Range | $T_J$, $T_{STG}$ | -65 to +150 | °C |

### Thermal Characteristics

| Characteristic | Symbol | Maximum | Unit |
|---|---|---|---|
| Thermal Resistance Junction to Case | Rθjc | 1.0 | °C/W |

**Figure - 1 Power Derating**




### Electrical Characteristics ($T_C$ = 25°C unless otherwise noted)

| Characteristic | Symbol | Minimum | Maximum | Unit |
|---|---|---|---|---|
| **OFF Characteristics** | | | | |
| Collector-Emitter Sustaining Voltage (1)<br>($I_C$ = 30mA, $I_B$ = 0) | $V_{CEO(SUS)}$ | 100 | - | V |
| Collector Cut off Current<br>($V_{CE}$ = 60V, $I_B$ = 0) | $I_{CEO}$ | - | 1.0 | mA |
| Collector Cut off Current<br>($V_{CE}$ = 100V, $V_{EB}$ = 0) | $I_{CES}$ | - | 0.7 | |
| Emitter Cut off Current<br>($V_{EB}$ = 5.0V, $I_C$ = 0) | $I_{EBO}$ | - | 1.0 | |
| **ON Characteristics (1)** | | | | |
| DC Current Gain<br>($I_C$ = 1.5A, $V_{CE}$ = 4.0V)<br>($I_C$ = 15A, $V_{CE}$ = 4.0V) | $h_{FE}$ | 25<br>15 | <br>75 | V |
| Collector-Emitter Saturation Voltage<br>($I_C$ = 15A, $I_B$ = 1.5A)<br>($I_C$ = 25A, $I_B$ = 5.0A) | $V_{CE(sat)}$ | - | 1.8<br>4.0 | |
| Base-Emitter On Voltage<br>($I_C$ = 15A, $V_{CE}$ = 4.0V)<br>($I_C$ = 25A, $V_{CE}$ = 4.0V) | $V_{BE(on)}$ | - | 2.0<br>4.0 | |
| **Dynamic Characteristics** | | | | |
| Current Gain Bandwidth Product (2)<br>($I_C$ = 1.0mA, $V_{CE}$ = 10V, $f_{TEST}$ = 1MHz) | $f_T$ | 3.0 | - | MHz |
| Small-Signal Current Gain<br>($I_C$ = 1.0A, $V_{CE}$ = 10V, f = 1kHz) | $h_{fe}$ | 25 | - | - |

(1) Pulse Test: Pulse Width = 300µs, Duty Cycle ≤2.0%

(2) $f_T = |h_{fe}| \bullet f_{test}$

**Figure - 2 DC Current Gain**

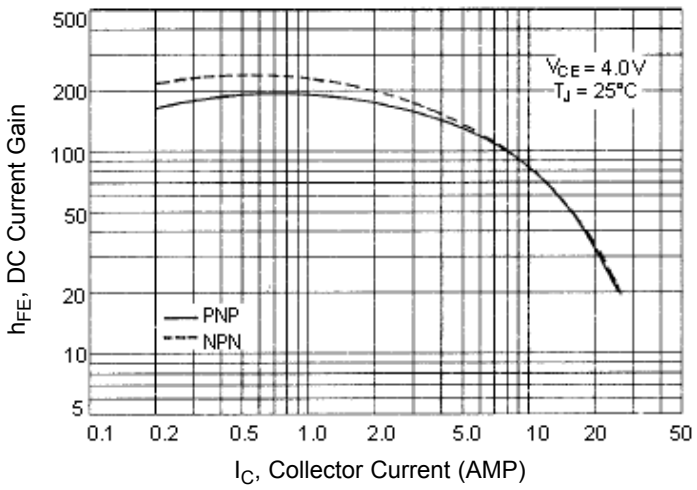



**Figure - 3 Turn-Off Time**

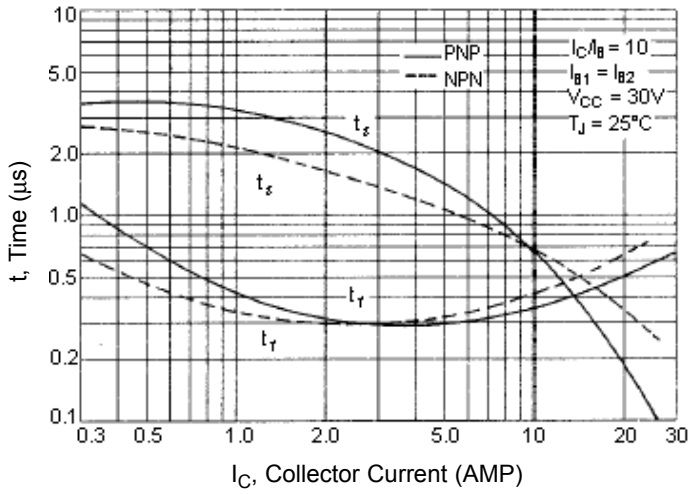



**Figure - 4 Turn-On time**

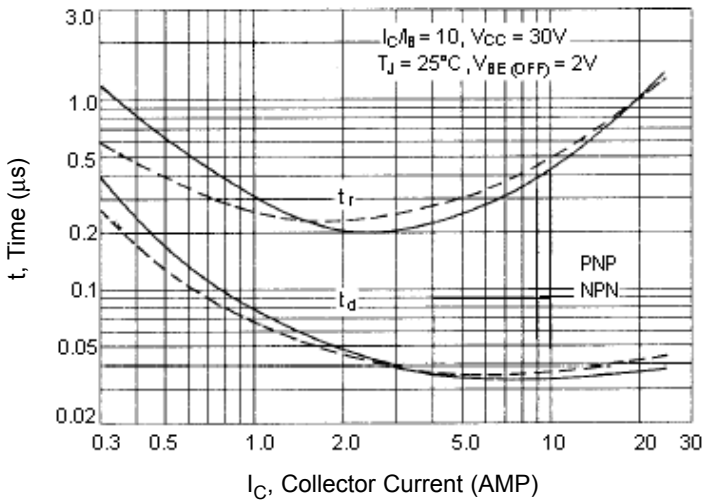



**Figure - 5 Reverse Base Safe Operating Area**

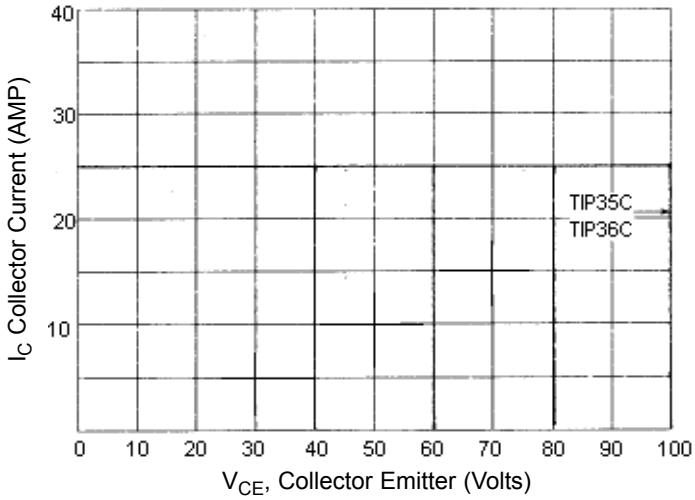
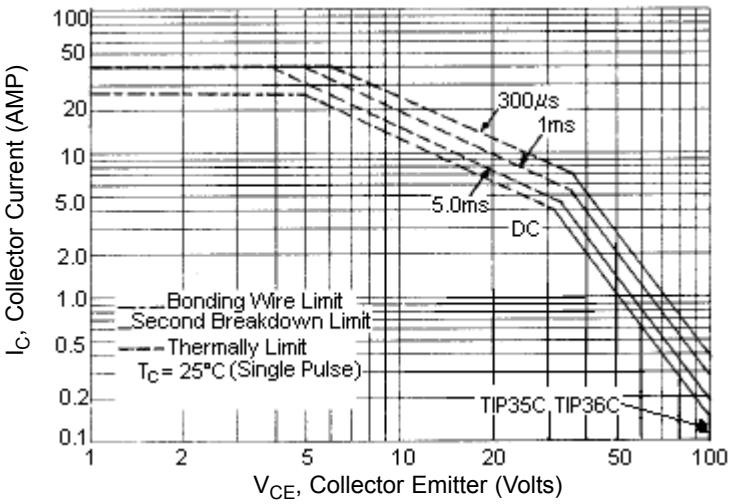



**Figure - 6 Active Region Safe Operating Area**




There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate $I_C$-$V_{CE}$ limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure - 6 is based on $T_C$ = 25°C; $T_{J(pk)}$ is variable depending on power level . Second breakdown pulse limits are valid for duty cycle to 10% but must be derated when $T_C \geq 25°C$, second breakdown limitations do not derate the same as thermal limitation.

## Specifiations

| $I_{C(av)}$ maximum (A) | $V_{CEO}$ maximum (V) | $h_{FE}$ minimum at $I_C$ = 15A | $P_{tot}$ at 25°C (W) | Package | Type | Part Number |
|---|---|---|---|---|---|---|
| 25 | 100 | 15 | 125 | TO-247 | NPN | TIP35C |
| | | | | | PNP | TIP36C |

**Notes:**

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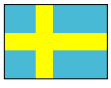

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