

TIP35C, 36C



Complementary Power Transistors



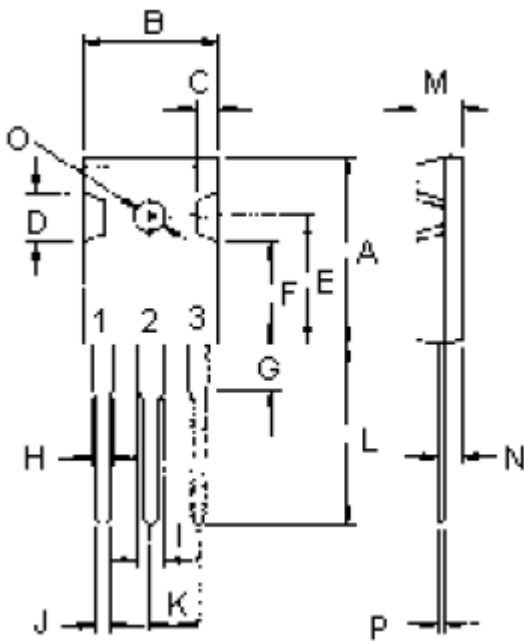
Features:

- Complementary
- Collector - emitter sustaining voltage : $V_{CEO(sus)} = 100$ V (Minimum)
- DC Current gain $h_{FE} = 25$ (Minimum) at $I_C = 1.5$ A
- Current gain - bandwidth product $f_T = 3$ MHz (Minimum) at $I_C = 1$ A

Application:

Designed for use in general purpose power amplifier and switching applications

TO-126



| Dimensions | Minimum | Maximum |
|------------|---------|---------|
| A | 20.63 | 22.38 |
| B | 15.38 | 16.2 |
| C | 1.9 | 2.7 |
| D | 5.1 | 6.1 |
| E | 14.81 | 15.22 |
| F | 11.72 | 12.84 |
| G | 4.2 | 4.5 |
| H | 1.82 | 2.46 |
| I | 2.92 | 3.23 |
| J | 0.89 | 1.53 |
| K | 5.26 | 5.66 |
| L | 18.5 | 21.5 |
| M | 4.68 | 5.36 |
| N | 2.4 | 2.8 |
| O | 3.25 | 3.65 |
| P | 0.55 | 0.7 |

NPN
TIP35C

PNP
TIP36C

25 Amperes
Complementary Silicon
Power Transistors
100 Volts
125 Watts

Dimensions : Millimetres

Maximum Ratings

| Characteristic | Symbol | Rating | Unit |
|--|----------------|-------------|--------------------------|
| Collector - emitter voltage | V_{CEO} | 100 | V |
| Collector - base voltage | V_{CBO} | 100 | V |
| Emitter - base voltage | V_{EBO} | 5 | A |
| Collector current - continuous- peak | I_C | 25 40 | A |
| Base current | I_B | 5 | A |
| Total power dissipation at $t_c = 25^\circ\text{C}$ derate above 25°C | P_D | 125 1 | W W/ $^\circ\text{C}$ |
| Operating and storage junction temperature range | T_J, T_{STG} | -65 to +150 | $^\circ\text{C}$ |

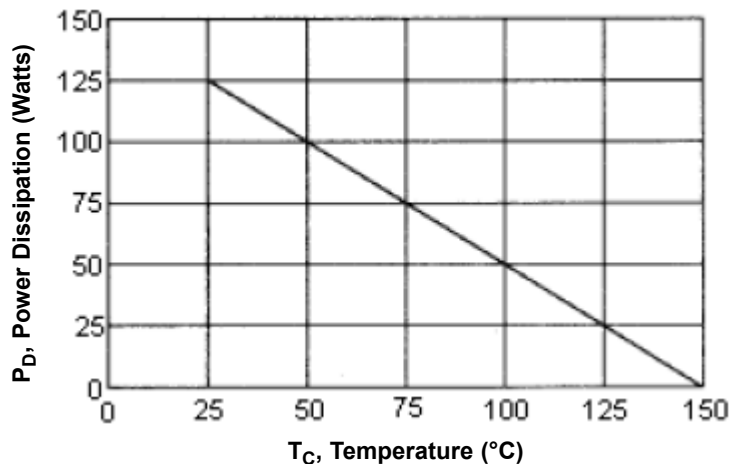
Thermal Characteristics

| Characteristic | Symbol | Maximum | Unit |
|-------------------------------------|-----------------|---------|--------------------|
| Thermal resistance junction to case | $R_{\theta jc}$ | 1 | $^\circ\text{C/W}$ |



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Figure - 1 Power Derating



Electrical Characteristics ($T_C = 25^\circ\text{C}$ Unless Otherwise Noted)

| Characteristic | Symbol | Minimum | Maximum | Unit |
|--|----------------|----------|----------|------|
| OFF Characteristics | | | | |
| Collector - emitter sustaining voltage (1) ($I_C = 30\text{ mA}$, $I_B = 0$) | $V_{CEO(SUS)}$ | 100 | - | V |
| Collector cut off current ($V_{CE} = 60\text{ V}$, $I_B = 0$) | I_{CEO} | - | 1 | V |
| Collector cut off current ($V_{CE} = 100\text{ V}$, $V_{EB} = 0$) | I_{CES} | - | 0.7 | mA |
| Emitter cut off current ($V_{EB} = 5\text{ V}$, $I_C = 0$) | I_{EBO} | - | 1 | mA |
| ON Characteristics (1) | | | | |
| DC current gain ($I_C = 1.5\text{ A}$, $V_{CE} = 4\text{ V}$) ($I_C = 15\text{ A}$, $V_{CE} = 4\text{ V}$) | h_{FE} | 25 15 | 75 | V |
| Collector - emitter saturation voltage ($I_C = 15\text{ A}$, $I_B = 1.5\text{ A}$) ($I_C = 25\text{ A}$, $I_B = 5\text{ A}$) | $V_{CE(sat)}$ | - | 1.8 4 | V |
| Base - emitter on voltage ($I_C = 15\text{ A}$, $V_{CE} = 4\text{ V}$) ($I_C = 25\text{ A}$, $V_{CE} = 4\text{ V}$) | $V_{BE(on)}$ | - | 2 4 | V |
| Dynamic Characteristics | | | | |
| Current gain - bandwidth product (2) ($I_C = 1\text{ A}$, $V_{CE} = 10\text{ V}$, $f_{TEST} = 50\text{ KHz}$) | f_T | 3 | - | MHz |
| Small-Signal Current Gain ($I_C = 1\text{ A}$, $V_{CE} = 10\text{ V}$, $f = 1\text{ kHz}$) | h_{fe} | 25 | - | - |

(1) Pulse Test : Pulse width = 300 μs , duty cycle $\leq 2\%$

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

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Figure - 2 DC Current Gain

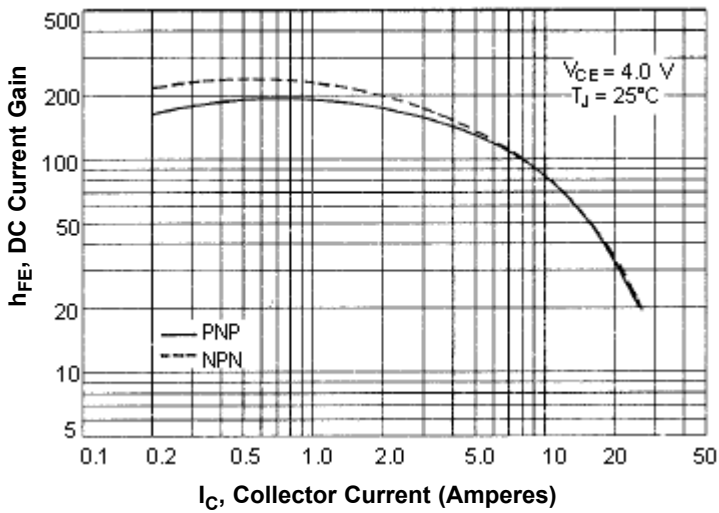


Figure - 3 Turn-Off Time

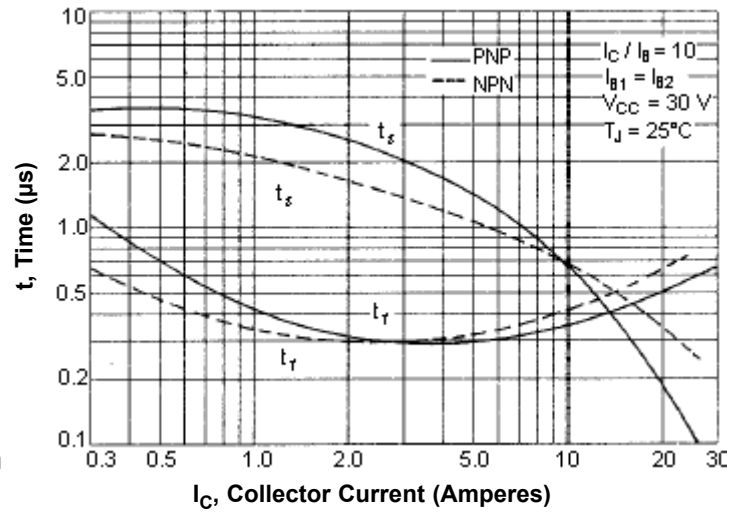


Figure - 4 Turn-On time

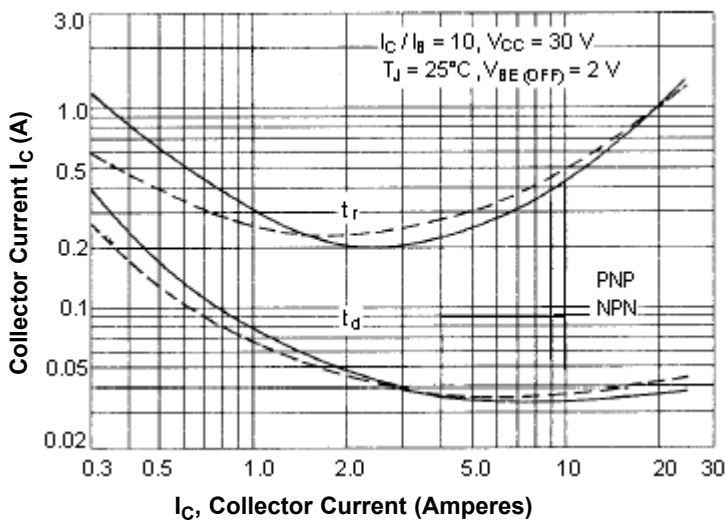
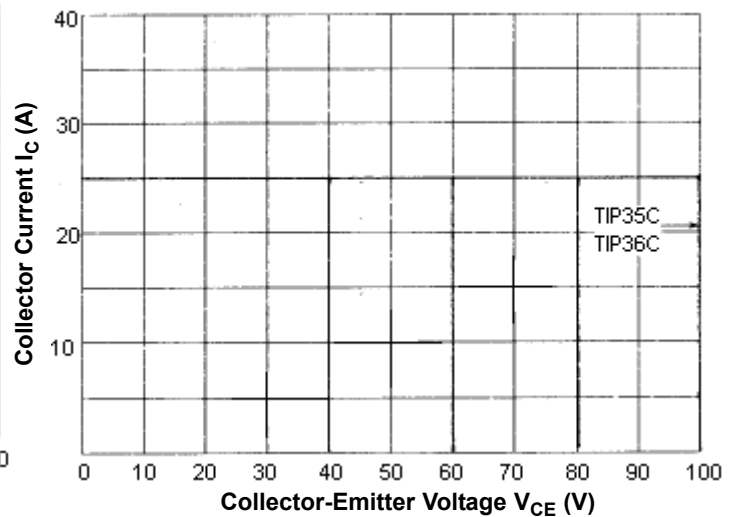


Figure - 5 Reverse Base Safe Operating Area

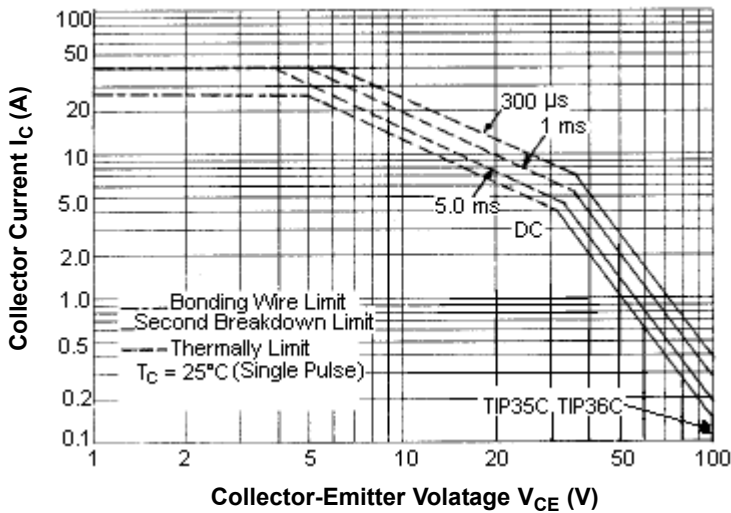


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Safe Operating Area



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

Specification Table

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

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