

COMPLEMENTARY SILICON POWER TRANSISTORS

- STMicroelectronics PREFERRED SALESTYPES
- COMPLEMENTARY PNP - NPN DEVICES

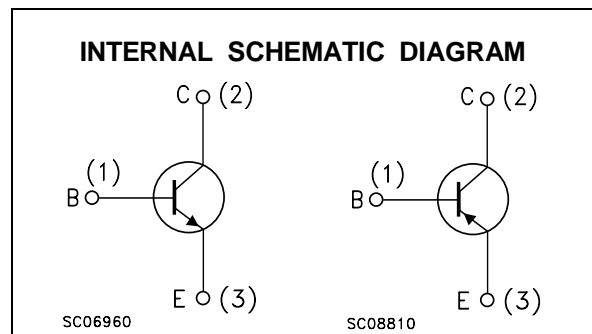
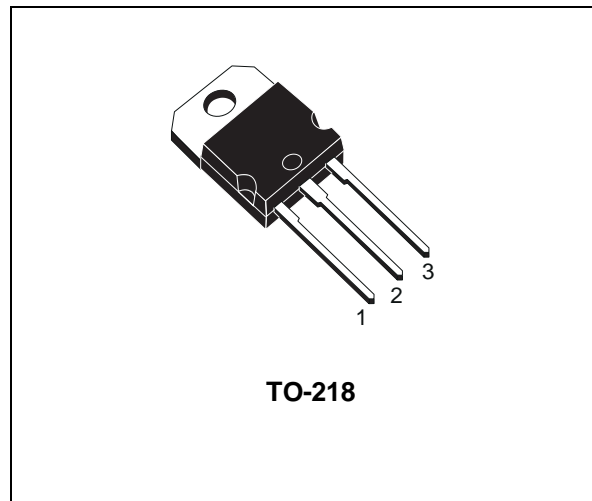
APPLICATIONS

- GENERAL PURPOSE SWITCHING

DESCRIPTION

The TIP33C is a silicon Epitaxial-Base NPN power transistor mounted in TO-218 plastic package. It is intended for use in linear and switching applications.

The complementary PNP type is TIP34C.



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | | Unit |
|-----------|--|-------|------------|------------------|
| | | NPN | TIP33C | |
| | | PNP | TIP34C | |
| V_{CBO} | Collector-Base Voltage ($I_E = 0$) | | 140 | V |
| V_{CES} | Collector-Emitter Voltage ($V_{BE} = 0$) | | 140 | V |
| V_{CEO} | Collector-Emitter Voltage ($I_B = 0$) | | 100 | V |
| V_{EBO} | Emitter-Base Voltage ($I_C = 0$) | | 7 | V |
| I_C | Collector Current | | 10 | A |
| I_{CM} | Collector Peak Current | | 12 | A |
| I_B | Base Current | | 3 | A |
| P_{tot} | Total Dissipation at $T_c \leq 25^\circ\text{C}$ | | 80 | W |
| T_{stg} | Storage Temperature | | -65 to 150 | $^\circ\text{C}$ |
| T_j | Max. Operating Junction Temperature | | 150 | $^\circ\text{C}$ |

For PNP types voltage and current values are negative.

TIP33C / TIP34C

THERMAL DATA

| | | | | |
|-----------------------|----------------------------------|-----|------|------|
| R _{thj-case} | Thermal Resistance Junction-case | Max | 1.56 | °C/W |
|-----------------------|----------------------------------|-----|------|------|

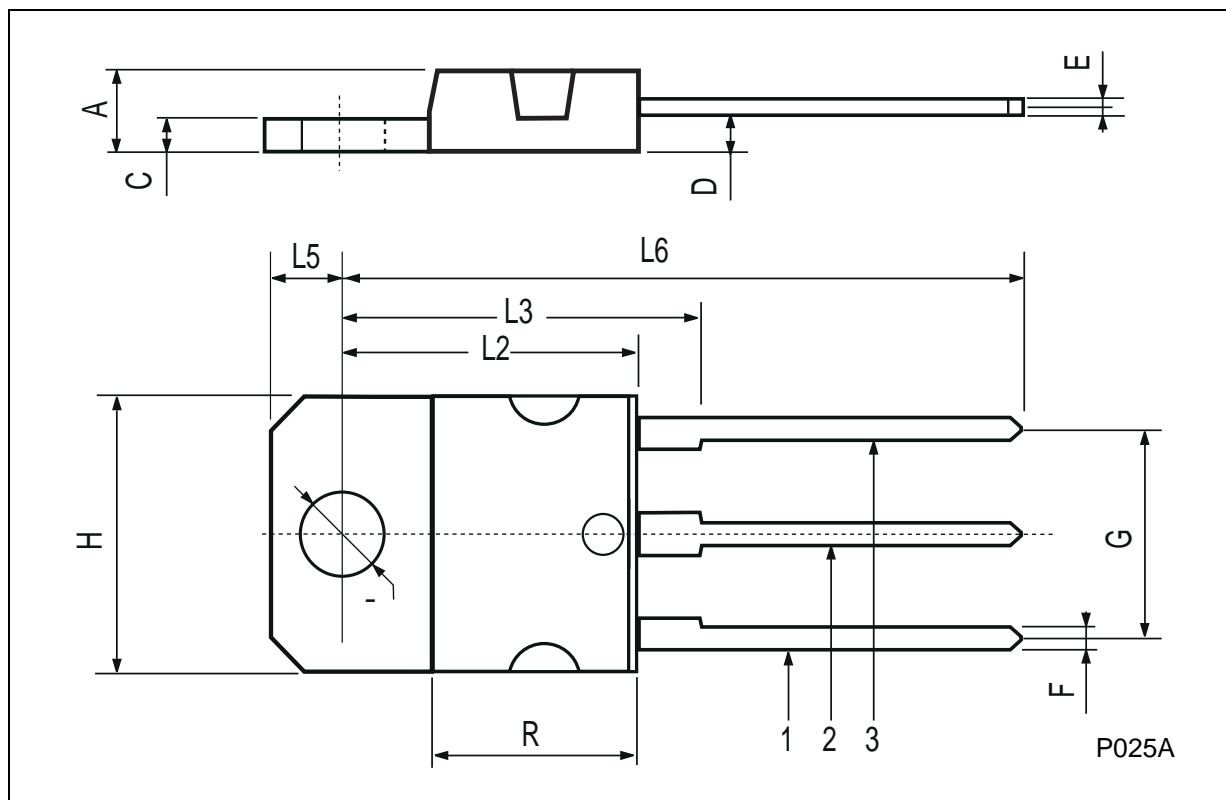
ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|--|---|------|-----------------|----------------|
| I _{CEs} | Collector Cut-off Current (V _{BE} = 0) | V _{CE} = 140 V | | | 400 | μA |
| I _{CEO} | Collector Cut-off Current (I _B = 0) | V _{CE} = 60 V | | | 0.7 | mA |
| I _{EBO} | Emitter Cut-off Current (I _C = 0) | V _{EB} = 5 V | | | 1 | mA |
| V _{CEO(sus)*} | Collector-Emitter Sustaining Voltage (I _B = 0) | I _C = 30 mA | 100 | | | V |
| V _{CE(sat)*} | Collector-Emitter Saturation Voltage | I _C = 3 A | I _B = 0.3 A | | 1 | V |
| | | I _C = 10 A | I _B = 2.5 A | | 4 | V |
| V _{BE(on)*} | Base-Emitter Voltage | I _C = 3 A | V _{CE} = 4 V | | 1.6 | V |
| | | I _C = 10 A | V _{CE} = 4 V | | 3 | V |
| h _{FE*} | DC Current Gain | I _C = 1 A | V _{CE} = 4 V | 40 | | |
| | | I _C = 3 A | V _{CE} = 4 V | 20 | 100 | |
| h _{fe} | Small Signal Current Gain | I _C = 0.5 A f = 1 KHz | V _{CE} = 10 V | 20 | | |
| f _T | Transition frequency | I _C = 0.5 A f = 1 MHz | V _{CE} = 10 V | 3 | | MHz |
| t _{on} t _s t _f | RESISTIVE LOAD Turn-on Time Storage Time Fall Time | V _{CC} = 30V V _{BB} = - 6 V t _p = 20 μs | I _C = 6 A I _{B1} = - I _{B2} = 0.6 A | | 0.6 0.4 1 | μs μs μs |

* Pulsed: Pulse duration = 300 μs, duty cycle 1.5 %

TO-218 (SOT-93) MECHANICAL DATA

| DIM. | mm | | | inch | | |
|------|------|------|------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 4.7 | | 4.9 | 0.185 | | 0.193 |
| C | 1.17 | | 1.37 | 0.046 | | 0.054 |
| D | | 2.5 | | | 0.098 | |
| E | 0.5 | | 0.78 | 0.019 | | 0.030 |
| F | 1.1 | | 1.3 | 0.043 | | 0.051 |
| G | 10.8 | | 11.1 | 0.425 | | 0.437 |
| H | 14.7 | | 15.2 | 0.578 | | 0.598 |
| L2 | - | | 16.2 | - | | 0.637 |
| L3 | | 18 | | | 0.708 | |
| L5 | 3.95 | | 4.15 | 0.155 | | 0.163 |
| L6 | | 31 | | | 1.220 | |
| R | - | | 12.2 | - | | 0.480 |
| ∅ | 4 | | 4.1 | 0.157 | | 0.161 |



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