



# TIP35CW TIP36CW

## Complementary Silicon High Power Transistors

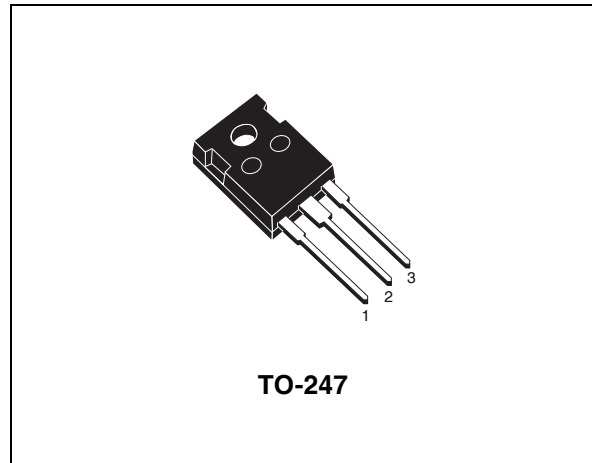
### Features

- STMicroelectronics PREFERRED SALESTYPES

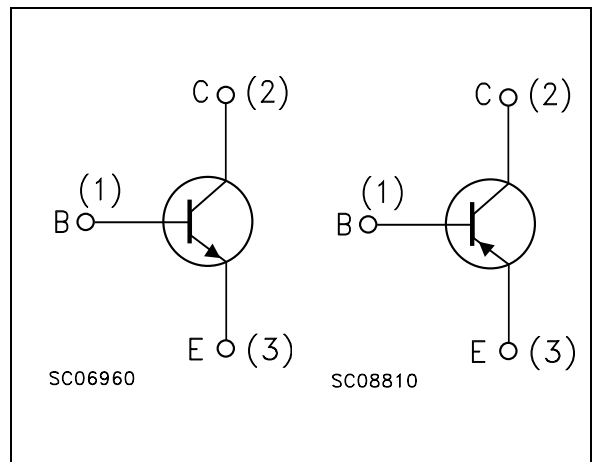
### Description

The device is a silicon Epitaxial-Base NPN transistor mounted in TO-247 plastic package. It is intended for use in power amplifier and switching applications.

The complementary PNP type is TIP36CW.



### Internal Schematic Diagram



### Order Codes

| Part Number | Marking  | Package | Packing |
|-------------|----------|---------|---------|
| TIP35CW     | TIP35C W | TO-247  | Tube    |
| TIP36CW     | TIP36C W | TO-247  | Tube    |

# 1 Absolute Maximum Ratings

**Table 1. Absolute Maximum Rating**

| Symbol    | Parameter                               |     | Value      | Unit       |
|-----------|---|-----|------------|------------|
|           |   | NPN | TIP35CW    |            |
|           |   | PNP | TIP36CW    |            |
| $V_{CBO}$ | Collector-Base Voltage ( $I_E = 0$ )    |     | 100        | V          |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ ) |     | 100        | V          |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )      |     | 5          | V          |
| $I_C$     | Collector Current                       |     | 25         | A          |
| $I_{CM}$  | Collector Peak Current ( $t_p < 5ms$ )  |     | 50         | A          |
| $I_B$     | Base Current                            |     | 5          | A          |
| $P_{tot}$ | Total Dissipation at $T_c = 25^\circ C$ |     | 125        | W          |
| $T_{stg}$ | Storage Temperature                     |     | -65 to 150 | $^\circ C$ |
| $T_J$     | Max. Operating Junction Temperature     |     | 150        | $^\circ C$ |

Note: For PNP types voltage and current values are negative.

**Table 2. Thermal Data**

| Symbol         | Parameter                        |     | Value | Unit         |
|----------------|----------------------------------|-----|-------|--------------|
| $R_{thj-case}$ | Thermal Resistance Junction-Case | Max | 1     | $^\circ C/W$ |

## 2 Electrical Characteristics

**Table 3. Electrical Characteristics** ( $T_{\text{case}} = 25^{\circ}\text{C}$ ; unless otherwise specified)

| Symbol                                  | Parameter  | Test Conditions   | Min.     | Typ. | Max.     | Unit   |
|---|--|---|----------|------|----------|--------|
| $I_{\text{CEO}}$                        | Collector Cut-off Current<br>( $I_{\text{B}} = 0$ )            | $V_{\text{CE}} = 60 \text{ V}$  |          |      | 1        | mA     |
| $I_{\text{EBO}}$                        | Emitter Cut-off Current<br>( $I_{\text{C}} = 0$ )              | $V_{\text{EB}} = 5 \text{ V}$   |          |      | 1        | mA     |
| $I_{\text{CES}}$                        | Collector Cut-off Current<br>( $V_{\text{BE}} = 0$ )           | $V_{\text{CE}} = \text{Rated } V_{\text{CEO}}$  |          |      | 0.7      | mA     |
| $V_{\text{CEO(sus)}}$<br><i>Note: 1</i> | Collector-Emitter<br>Sustaining Voltage ( $I_{\text{B}} = 0$ ) | $I_{\text{C}} = 30 \text{ mA}$  | 100      |      |          | V      |
| $h_{\text{FE}}$<br><i>Note: 1</i>       | DC Current Gain  | $I_{\text{C}} = 1.5 \text{ A}$ $V_{\text{CE}} = 4 \text{ V}$<br>$I_{\text{C}} = 15 \text{ A}$ $V_{\text{CE}} = 4 \text{ V}$ | 25<br>10 |      | 50       |        |
| $V_{\text{CE(sat)}}$<br><i>Note: 1</i>  | Collector-Emitter Saturation<br>Voltage                        | $I_{\text{C}} = 15 \text{ A}$ $I_{\text{B}} = 1.5 \text{ A}$<br>$I_{\text{C}} = 25 \text{ A}$ $I_{\text{B}} = 5 \text{ A}$  |          |      | 1.8<br>4 | V<br>V |
| $V_{\text{BE(on)}}$<br><i>Note: 1</i>   | Base-Emitter Voltage   | $I_{\text{C}} = 15 \text{ A}$ $V_{\text{CE}} = 4 \text{ V}$<br>$I_{\text{C}} = 25 \text{ A}$ $V_{\text{CE}} = 4 \text{ V}$  |          |      | 2<br>4   | V<br>V |
| $f_{\text{T}}$                          | Transition Frequency   | $I_{\text{C}} = 1 \text{ A}$ $V_{\text{CE}} = 10 \text{ V}$ $f = 1 \text{ MHz}$   | 3        |      |          | MHz    |
| $h_{\text{fe}}$                         | Small Signal Current Gain                                      | $I_{\text{C}} = 1 \text{ A}$ $V_{\text{CE}} = 10 \text{ V}$ $f = 1 \text{ MHz}$   | 25       |      |          |        |

Note: 1 Pulsed duration = 300  $\mu\text{s}$ , duty cycle  $\leq 1.5\%$ .

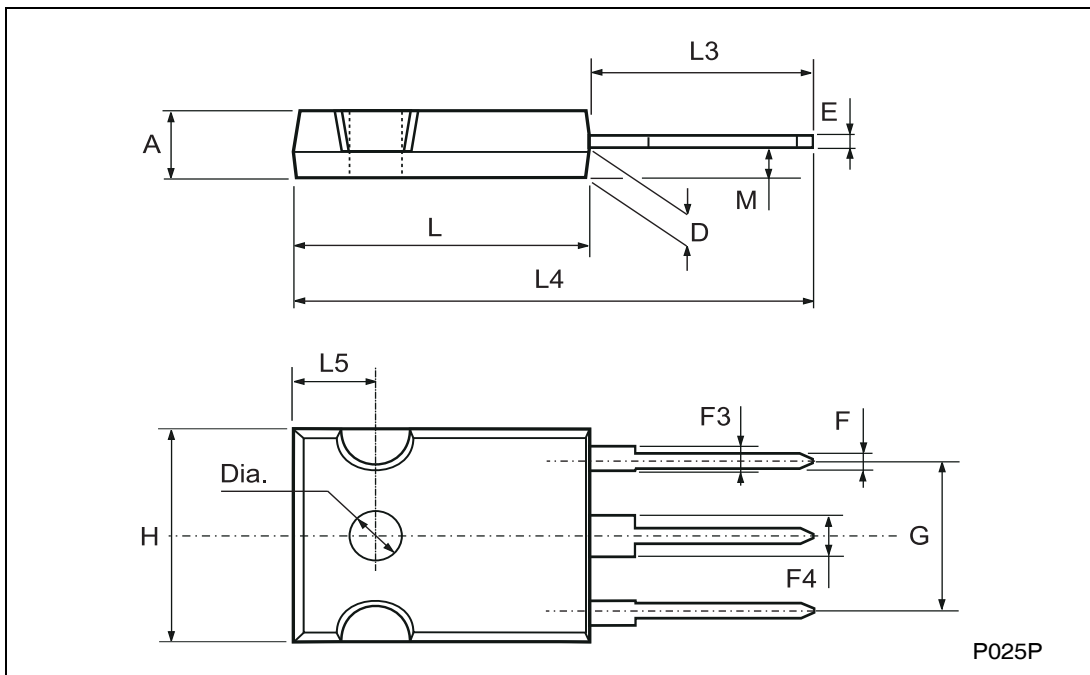
2 For PNP types voltage and current values are negative.

### 3 Package Mechanical Data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: [www.st.com](http://www.st.com)

**TO-247 MECHANICAL DATA**

| DIM. | mm   |      |      | inch  |       |       |
|------|------|------|------|-------|-------|-------|
|      | MIN. | TYP. | MAX. | MIN.  | TYP.  | MAX.  |
| A    | 4.7  |      | 5.3  | 0.185 |       | 0.209 |
| D    | 2.2  |      | 2.6  | 0.087 |       | 0.102 |
| E    | 0.4  |      | 0.8  | 0.016 |       | 0.031 |
| F    | 1    |      | 1.4  | 0.039 |       | 0.055 |
| F3   | 2    |      | 2.4  | 0.079 |       | 0.094 |
| F4   | 3    |      | 3.4  | 0.118 |       | 0.134 |
| G    |      | 10.9 |      |       | 0.429 |       |
| H    | 15.3 |      | 15.9 | 0.602 |       | 0.626 |
| L    | 19.7 |      | 20.3 | 0.776 |       | 0.779 |
| L3   | 14.2 |      | 14.8 | 0.559 |       | 0.582 |
| L4   |      | 34.6 |      |       | 1.362 |       |
| L5   |      | 5.5  |      |       | 0.217 |       |
| M    | 2    |      | 3    | 0.079 |       | 0.118 |



## 4 Revision History

| Date        | Revision | Changes                  |
|-------------|----------|--------------------------|
| 02-Nov-2005 | 1        | Initial release.         |
| 12-Dec-2005 | 2        | Added the ECOPACK Label. |

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