

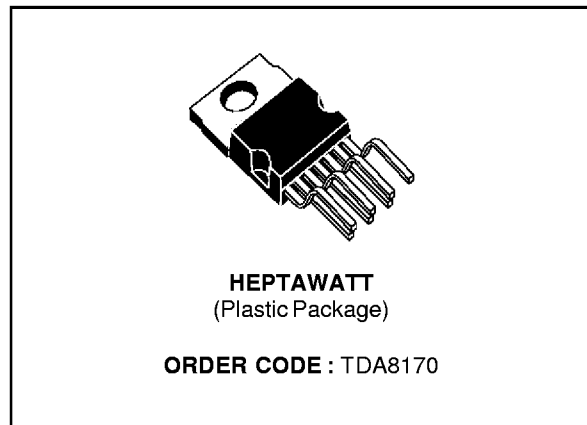
TV VERTICAL DEFLECTION OUTPUT CIRCUIT

The functions incorporated are :

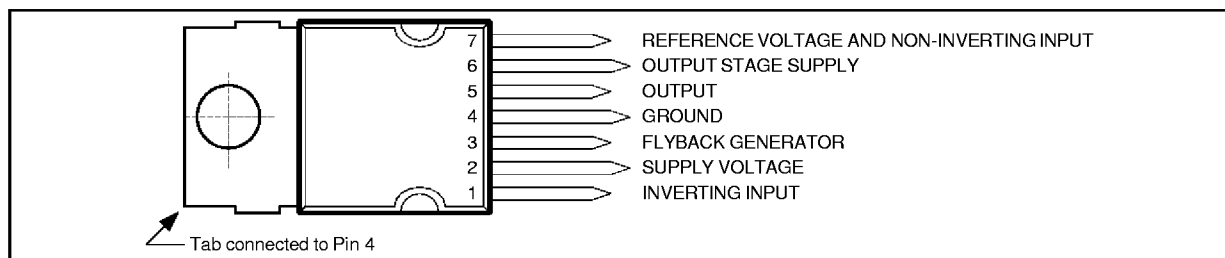
- POWER AMPLIFIER
- FLYBACK GENERATOR
- REFERENCE VOLTAGE
- THERMAL PROTECTION

DESCRIPTION

The TDA8170 is a monolithic integrated circuit in HEPTAWATT™ package. It is a high efficiency power booster for direct driving of vertical windings of TV yokes. It is intended for use in Colour and B & W television receivers as well as in monitors and displays.

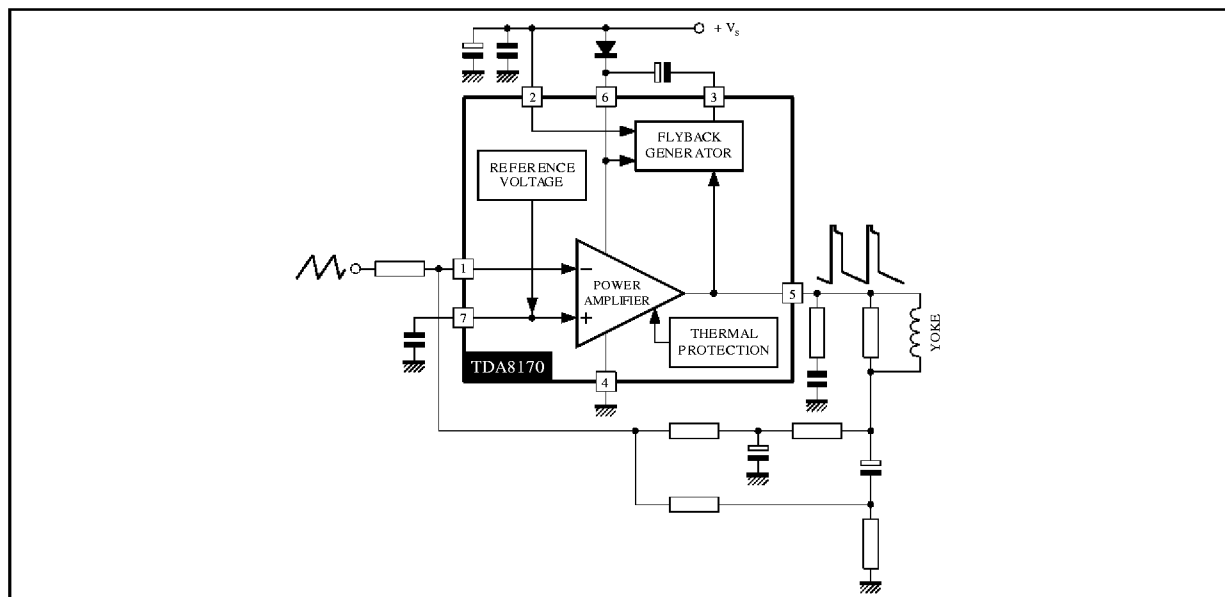


PIN CONNECTIONS



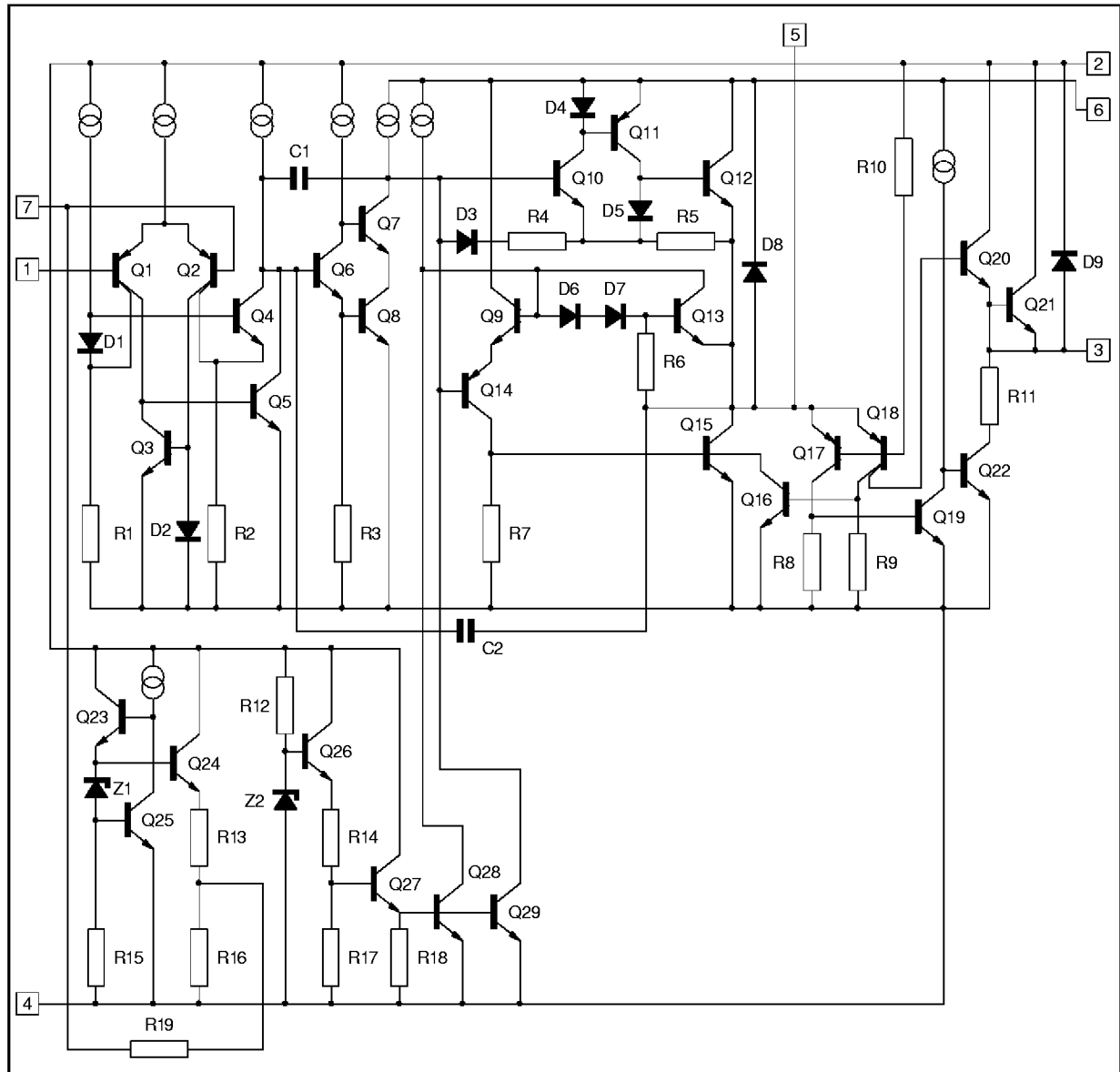
8170-01.EPS

BLOCK DIAGRAM



8170-02.EPS

SCHEMATIC DIAGRAM



8170-03.EPS

ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|----------------|--|----------------|------|
| V_S | Supply Voltage (pin 2) | 35 | V |
| V_5, V_6 | Flyback Peak Voltage | 60 | V |
| V_3 | Voltage at Pin 3 | + V_S | |
| V_1, V_7 | Amplifier Input Voltage | + $V_S, - 0.5$ | V |
| I_o | Output Peak Current (non repetitive, $t = 2$ msec) | 2.5 | A |
| I_o | Output Peak Current at $f = 50$ or 60 Hz, $t \leq 10$ μ sec | 3 | A |
| I_o | Output Peak Current at $f = 50$ or 60 Hz, $t > 10$ μ sec | 2 | A |
| I_3 | Pin 3 DC Current at $V_5 < V_2$ | 100 | mA |
| I_3 | Pin 3 Peak to Peak Flyback Current at $f = 50$ or 60 Hz, $t_{fly} \leq 1.5$ msec | 3 | A |
| P_{tot} | Total Power Dissipation at $T_{case} = 90$ °C | 20 | W |
| T_{stg}, T_j | Storage and Junction Temperature | - 40, +150 | °C |

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THERMAL DATA

| Symbol | Parameter | Value | Unit |
|------------------|----------------------------------|--------|------|
| $R_{th\ j-case}$ | Thermal Resistance Junction-case | Max. 3 | °C/W |

8170-02.TBL

ELECTRICAL CHARACTERISTICS

(refer to the test circuits, $V_S = 35V$, $T_{amb} = 25^\circ C$ unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit | Fig. |
|---------------------------------|---|-------------------------------------|------|-------|------|---------|------|
| I_2 | Pin 2 Quiescent Current | $I_3 = 0, I_5 = 0$ | | 8 | 16 | mA | 1a |
| I_6 | Pin 6 Quiescent Current | $I_3 = 0, I_5 = 0$ | | 16 | 36 | mA | 1a |
| I_1 | Amplifier Input Bias Current | $V_1 = 1$ V | | - 0.1 | - 1 | μ A | 1a |
| V_7 | Reference Voltage | | | 2.2 | | V | 1a |
| $\frac{\Delta V_7}{\Delta V_S}$ | Reference Voltage Drift versus Supply Voltage | $V_S = 15$ to 30 V | | 1 | 2 | mV/V | 1a |
| V_{3L} | Pin 3 Saturation Voltage to GND | $I_3 = 20$ mA | | 1 | | V | 1c |
| V_5 | Quiescent Output Voltage | $V_S = 35$ V, $R_a = 39$ k Ω | | 18 | | V | 1d |
| | | $V_S = 15$ V, $R_a = 13$ k Ω | | 7.5 | | V | 1d |
| V_{5L} | Output Saturation Voltage to GND | $I_5 = 1.2$ A | | 1 | 1.4 | V | 1c |
| | | $I_5 = 0.7$ A | | 0.7 | 1 | V | 1c |
| V_{5H} | Output Saturation Voltage to Supply | - $I_5 = 1.2$ A | | 1.6 | 2.2 | V | 1b |
| | | - $I_5 = 0.7$ A | | 1.3 | 1.8 | V | 1b |
| T_j | Junction Temperature for Thermal Shut Down | | | 140 | | °C | |

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TDA8170

Figure 1a : Measurement of I_1 , I_2 , I_6 , V_7 , $\Delta V_7/\Delta V_S$

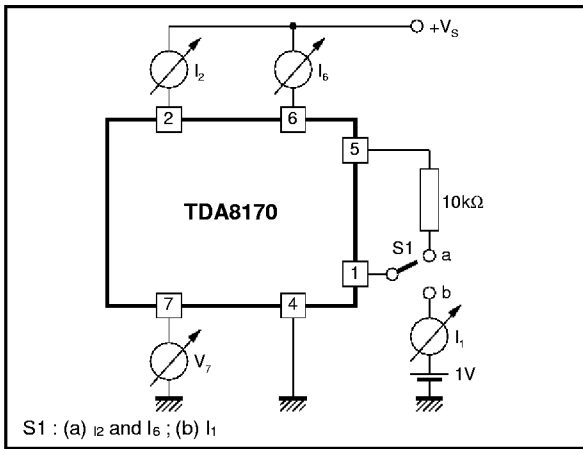


Figure 1b : Measurement of V_{5H}

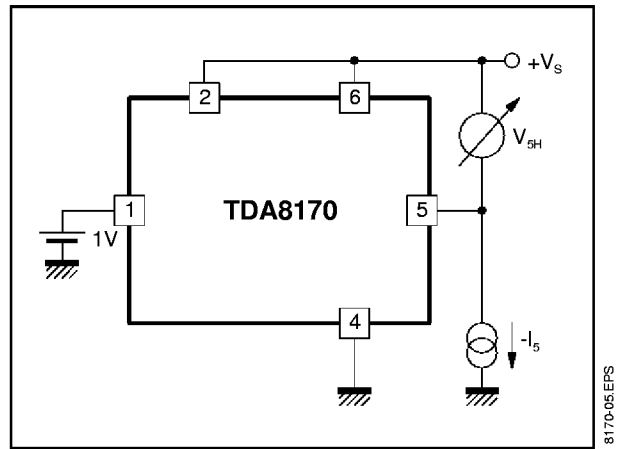


Figure 1c : Measurement of V_{3L} , V_{5L}

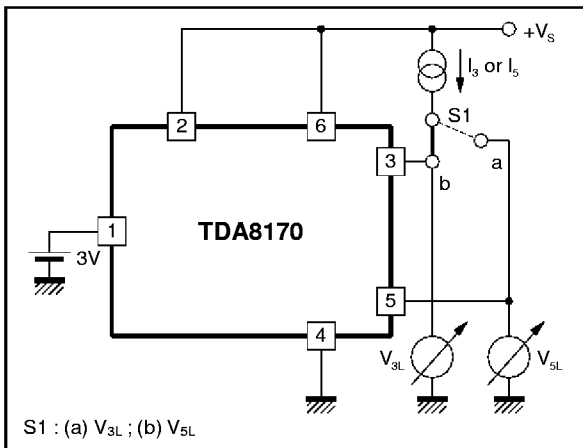


Figure 1d : Measurement of V_5

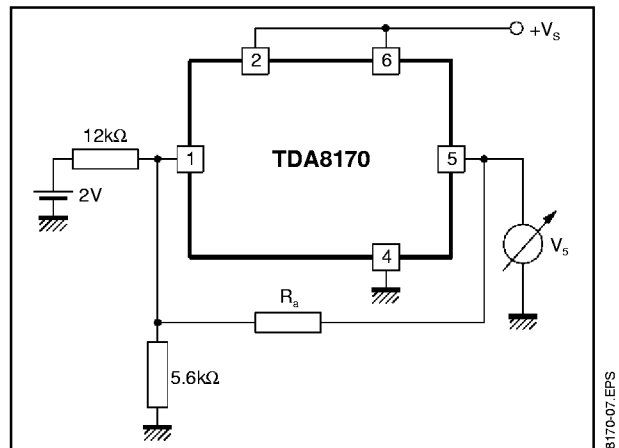


Figure 2 : Application Schematic

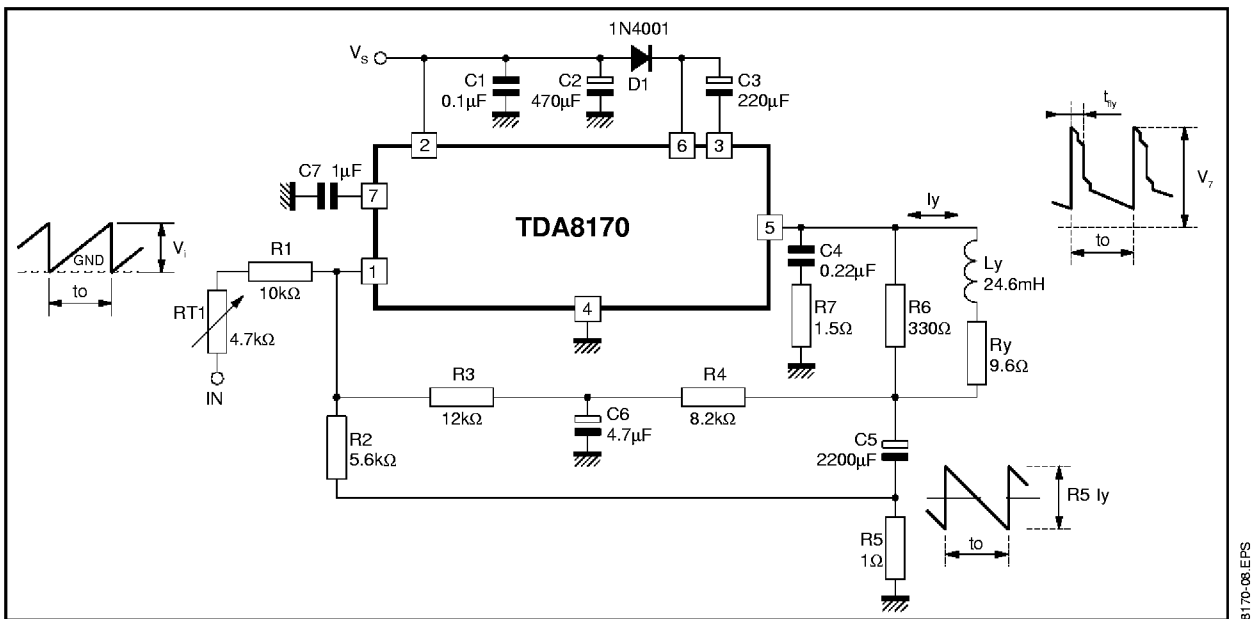
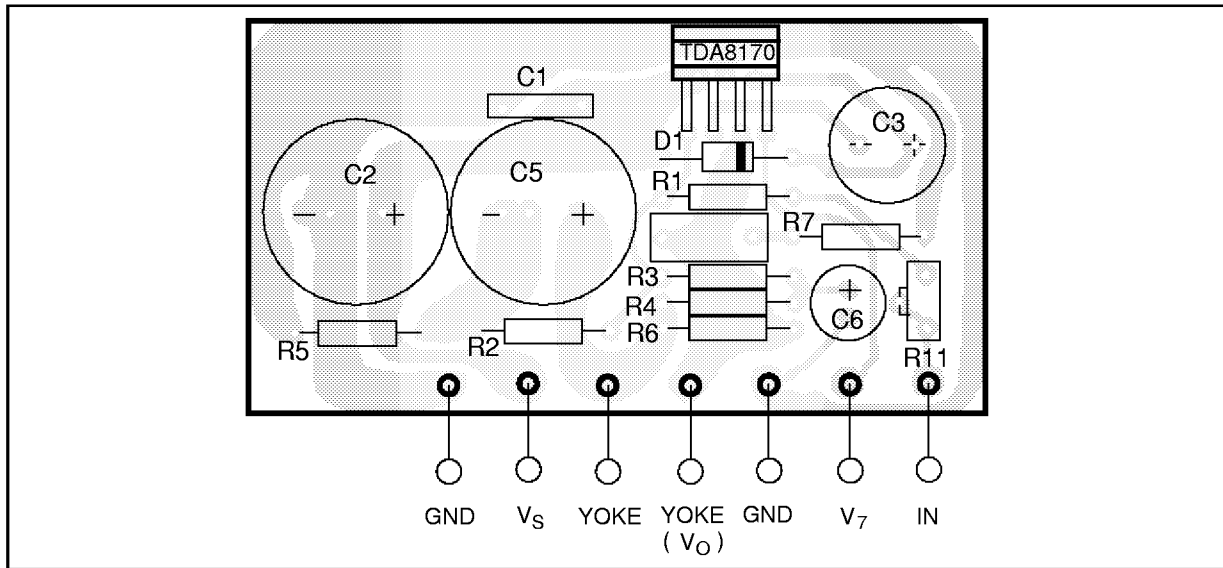


Figure 3 : PC Board and Component layout of the Circuit of fig. 2(1 : 1 scale)



8170-08.EPS

COMPONENTS LIST FOR TYPICAL APPLICATIONS

| Component | 110 ° TVC 5.9 Ω/10 mH 1.95 App | 110 ° TVC 9.6 Ω/24.6 mH 1.2 App | 90 ° TVC 15 Ω/30 mH 0.82 App | Unit |
|-----------|--------------------------------------|---------------------------------------|------------------------------------|------|
| RT1 | 10 | 4.7 | 10 | kΩ |
| R1 | 12 | 10 | 12 | kΩ |
| R2 | 10 | 5.6 | 5.6 | kΩ |
| R3 | 27 | 12 | 18 | kΩ |
| R4 | 12 | 8.2 | 5.6 | kΩ |
| R5 | 0.82 | 1 | 1 | Ω |
| R6 | 270 | 330 | 330 | Ω |
| R7 | 1.5 | 1.5 | 1.5 | Ω |
| D1 | 1N 4001 | 1N 4001 | 1N 4001 | - |
| C1 | 0.1 | 0.1 | 0.1 | μF |
| C2 el. | 1000/25 V | 470/25 V | 470/25 V | μF |
| C3 el. | 220/25 V | 220/25 V | 220/25 V | μF |
| C4 | 0.22 | 0.22 | 0.22 | μF |
| C5 el. | 200/25 V | 2200/25 V | 1000/16 V | μF |
| C6 el. | 4.7/16 V | 4.7/16 V | 10/16 V | μF |
| C7 | 1.0/16V | 1.0/16V | 1.0/16V | μF |

8170-04.TBL

TYPICAL PERFORMANCES

| Parameter | 110 ° TVC 5.9 Ω/10 mH | 110 ° TVC 9.6 Ω/27 mH | 90 ° TVC 15 Ω/30 mH | Unit |
|----------------------------------|--------------------------|--------------------------|------------------------|-----------------|
| V _s - Supply Voltage | 24 | 22.5 | 25 | V |
| I _s - Current | 280 | 175 | 125 | mA |
| t _{fly} - Flyback Time | 0.6 | 1 | 0.7 | ms |
| P _{tot} - Power Dissip. | 4.2 | 2.5 | 2.05 | W |
| R _{th o-a} - Heatsink | 7 | 13 | 16 | °C/W |
| T _{amb} | 60 | 60 | 60 | °C |
| T _{j max} | 110 | 110 | 110 | °C |
| T _o | 20 | 20 | 20 | ms |
| V _l | 2.5 | 2.5 | 2.5 | V _{pp} |
| V ₇ | 2.5 | 2.5 | 2.5 | V _p |

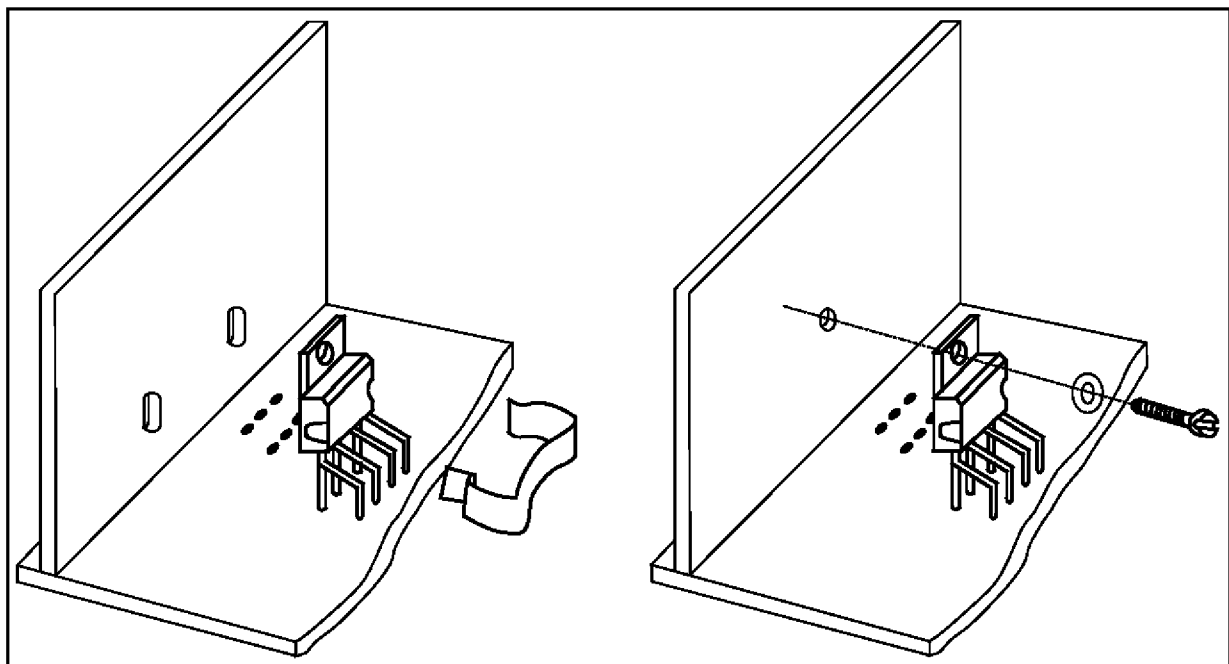
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MOUNTING INSTRUCTIONS

The power dissipated in the circuit must be removed by adding an external heatsink. Thanks to the HEPTAWATT™ package attaching the heatsink is very simple, a screw a compression

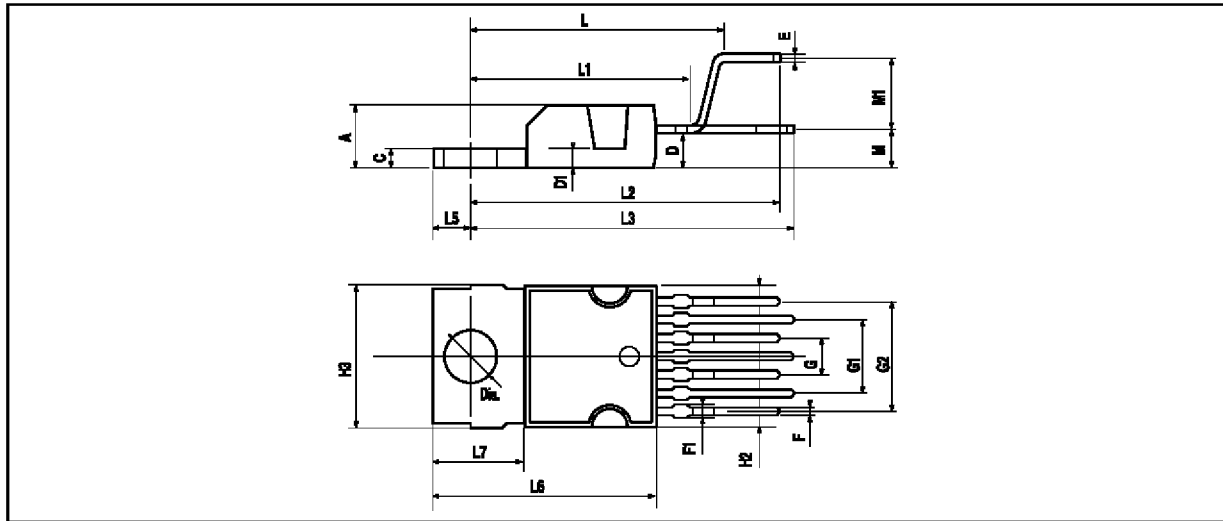
spring (clip) being sufficient. Between the heatsink and the package it is better to insert a layer of silicon grease, to optimize the thermal contact ; no electrical isolation is needed between the two surfaces.

Figure 4 : Mounting Examples



8170-10.EPS

PACKAGE MECHANICAL DATA : 7 PINS - PLASTIC HEPTAWATT



| Dimensions | Millimeters | | | Inches | | |
|------------|-------------|-------|------|--------|-------|-------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | | 4.8 | | | 0.189 |
| C | | | 1.37 | | | 0.054 |
| D | 2.4 | | 2.8 | 0.094 | | 0.110 |
| D1 | 1.2 | | 1.35 | 0.047 | | 0.053 |
| E | 0.35 | | 0.55 | 0.014 | | 0.022 |
| F | 0.6 | | 0.8 | 0.024 | | 0.031 |
| F1 | | | 0.9 | | | 0.035 |
| G | 2.41 | 2.54 | 2.67 | 0.095 | 0.100 | 0.105 |
| G1 | 4.91 | 5.08 | 5.21 | 0.193 | 0.200 | 0.205 |
| G2 | 7.49 | 7.62 | 7.8 | 0.295 | 0.300 | 0.307 |
| H2 | | | 10.4 | | | 0.409 |
| H3 | 10.05 | | 10.4 | 0.396 | | 0.409 |
| L | | 16.97 | | | 0.668 | |
| L1 | | 14.92 | | | 0.587 | |
| L2 | | 21.54 | | | 0.848 | |
| L3 | | 22.62 | | | 0.891 | |
| L5 | 2.6 | | 3 | 0.102 | | 0.118 |
| L6 | 15.1 | | 15.8 | 0.594 | | 0.622 |
| L7 | 6 | | 6.6 | 0.236 | | 0.260 |
| M | | 2.8 | | | 0.110 | |
| M1 | | 5.08 | | | 0.200 | |
| Dia. | 3.65 | | 3.85 | 0.144 | | 0.152 |

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