



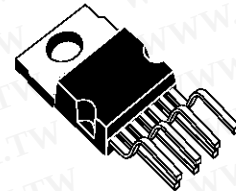
**TDA8172**

## TV VERTICAL DEFLECTION OUTPUT CIRCUIT

- POWER AMPLIFIER
- FLYBACK GENERATOR
- THERMAL PROTECTION

### DESCRIPTION

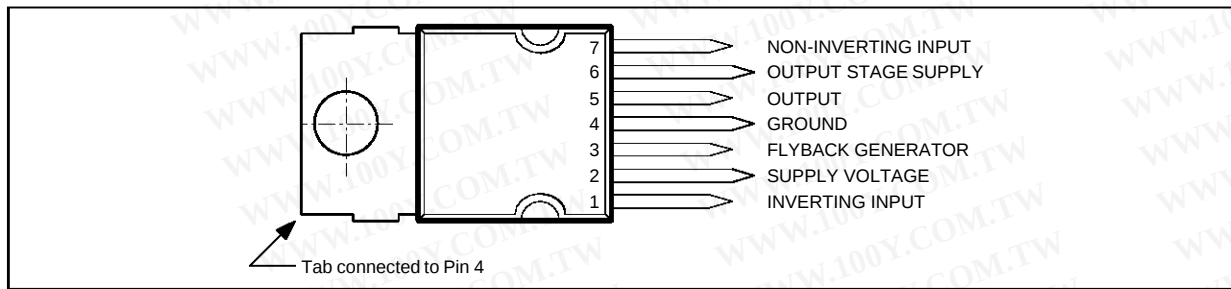
The TDA8172 is a monolithic integrated circuit in HEPTAWATT™ package. It is a high efficiency power booster for direct driving of vertical windings of TV yokes. It is intended for use in Color and B & W television as well as in monitors and displays.



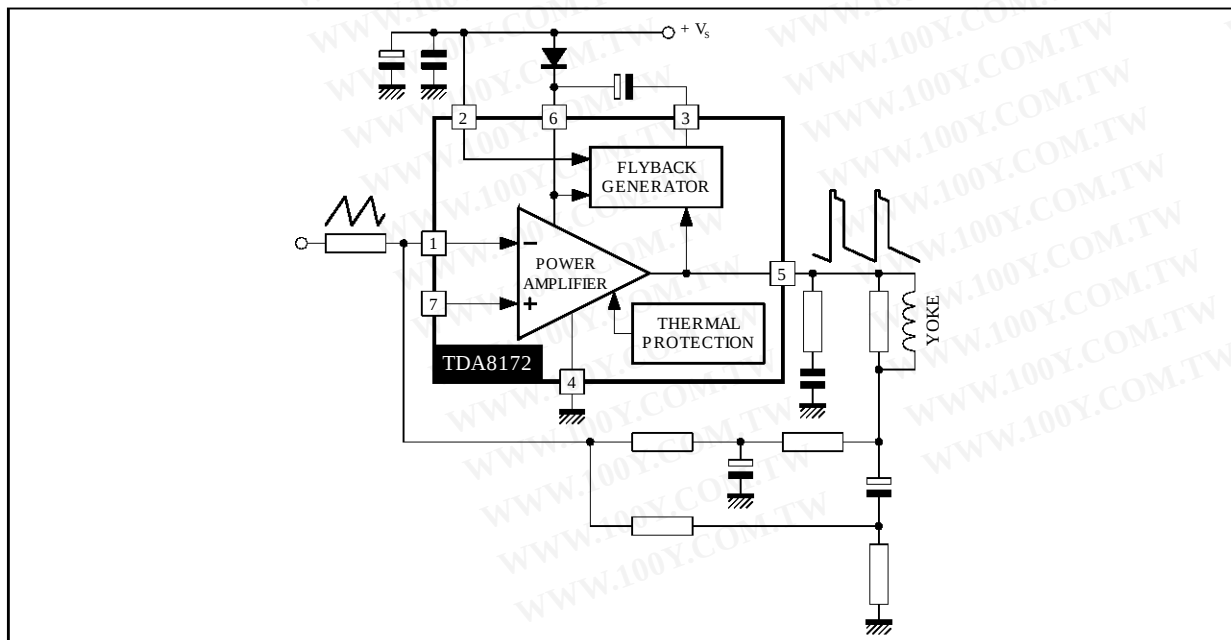
**HEPTAWATT**  
(Plastic Package)

**ORDER CODE : TDA8172**

### PIN CONNECTIONS (top view)



### BLOCK DIAGRAM



## 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                                                          | + $V_S$<br>– 0.5 | V    |
| $I_o$          | Output Peak Current (non repetitive, $t = 2$ ms)                                 | 2.5              | A    |
| $I_o$          | Output Peak Current at $f = 50$ or $60$ Hz, $t \leq 10$ $\mu$ s                  | 3                | A    |
| $I_o$          | Output Peak Current at $f = 50$ or $60$ Hz, $t > 10$ $\mu$ s                     | 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, $t_{fly} \leq 1.5$ ms | 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   |

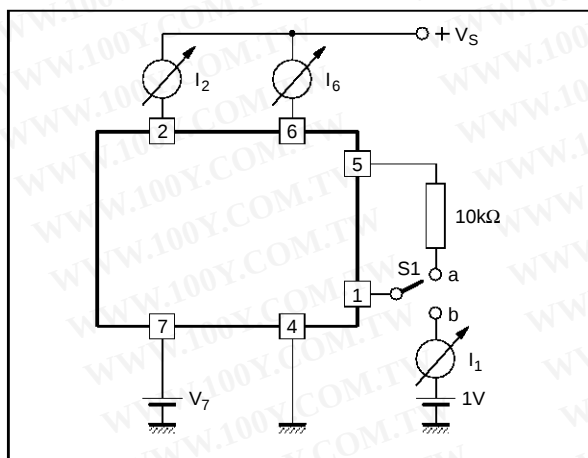
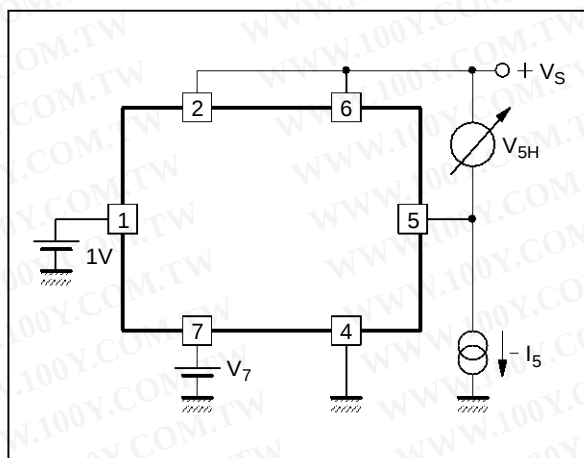
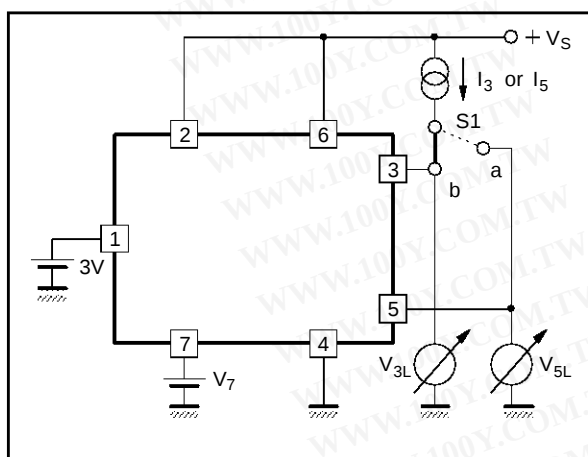
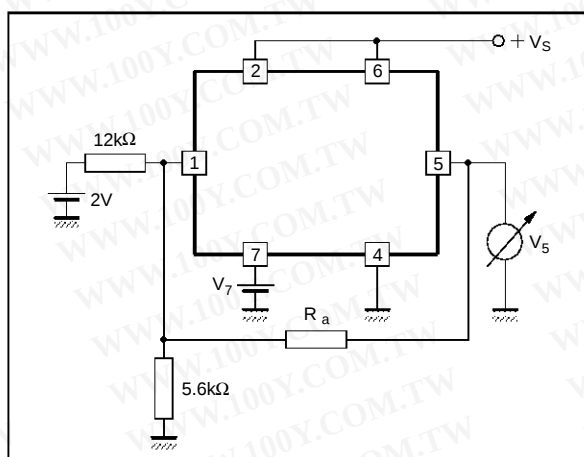
## THERMAL DATA

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

## ELECTRICAL CHARACTERISTICS

(refer to the test circuits,  $V_S = 35$ V,  $T_{amb} = 25$ °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, $V_7 = 2$ V            |      | – 0.1 | – 1  | $\mu$ A | 1a   |
|          |                                            | $V_1 = 2$ V, $V_7 = 1$ V            |      | – 0.1 | – 1  | $\mu$ A | 1a   |
| $V_{3L}$ | Pin 3 Saturation Voltage to GND            | $I_3 = 20$ mA                       |      | 1     | 1.5  | V       | 1c   |
| $V_5$    | Quiescent Output Voltage                   | $V_S = 35$ V, $R_a = 39$ k $\Omega$ |      | 18    |      | 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      |      |

**Figure 1 : DC Test Circuits.****Figure 1 a : Measurement of  $I_1$  ;  $I_2$  ;  $I_6$** S1 : (a)  $I_2$  and  $I_6$  ; (b)  $I_1$ **Figure 1 b : Measurement of  $V_{5H}$** **Figure 1 c : Measurement of  $V_{3L}$  ;  $V_{5L}$** S1 : (a)  $V_{3L}$  ; (b)  $V_{5L}$ **Figure 1 d : Measurement of  $V_5$** 

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The diagram illustrates a current source circuit using a TDA8172 integrated circuit. The circuit is powered by a supply voltage  $V_S$  and includes a reference voltage  $V_{REF}$ . Key components and their values are as follows:

- Diode:** 1N4001 (D1)
- Capacitors:**
  - C1:  $0.1\mu F$
  - C2:  $470\mu F$
  - C3:  $220\mu F$
  - C4:  $0.22\mu F$
  - C6:  $4.7\mu F$
  - C5:  $2200\mu F$
- Resistors:**
  - R1:  $10k\Omega$
  - R2:  $5.6k\Omega$
  - R3:  $12k\Omega$
  - R4:  $8.2k\Omega$
  - R5:  $8.2\Omega$
  - R6:  $330\Omega$
  - R7:  $1.5\Omega$
  - RT1:  $4.7k\Omega$
- Inductor:**  $L_y$  (24.6mH)
- Other components:**  $R_y$  ( $9.6\Omega$ )

The circuit includes two waveforms:

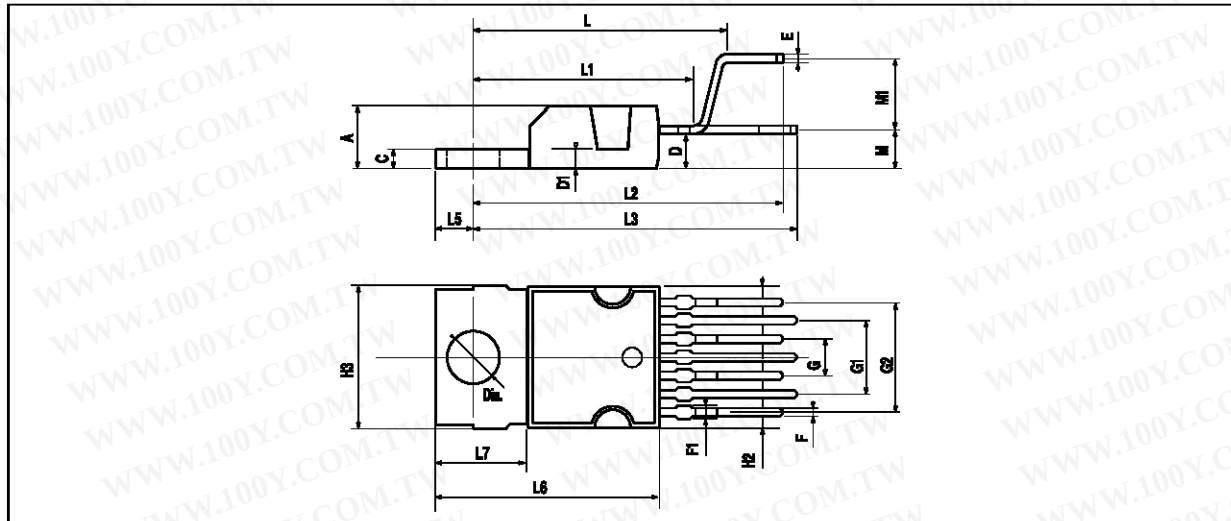
- Input Voltage ( $V_i$ ):** A sawtooth wave with a period  $t_o$  and a peak-to-peak voltage  $V_i$ .
- Output Current ( $I_y$ ):** A pulse-width modulated (PWM) signal with a period  $t_o$ , a pulse width  $t_{fly}$ , and a peak voltage  $V_7$ .

\*Recommended for  $V_{REF}$  filtering

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 or 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, since the tab is connected to Pin 4 which is ground.

PACKAGE MECHANICAL DATA : 9 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         |       | 08   | 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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