



TDA9302H

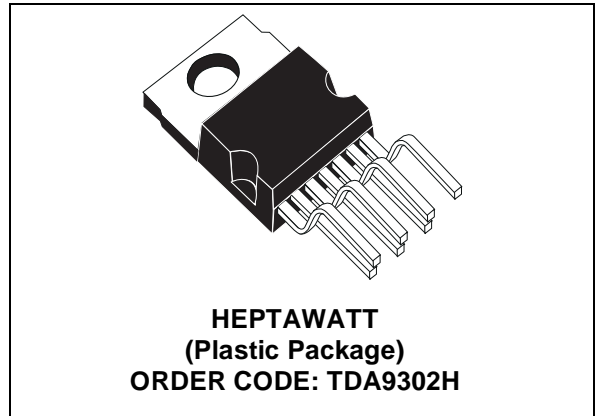
TV VERTICAL DEFLECTION OUTPUT CIRCUIT

FEATURES

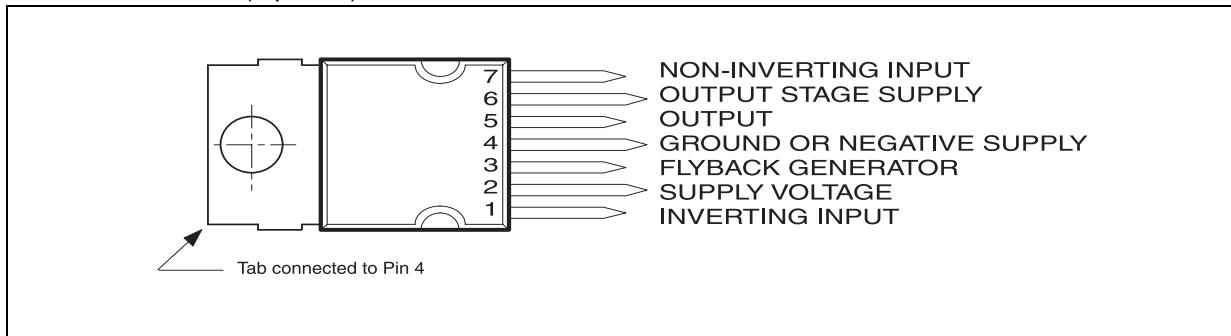
- Power Amplifier
- Flyback Generator
- Thermal Protection

DESCRIPTION

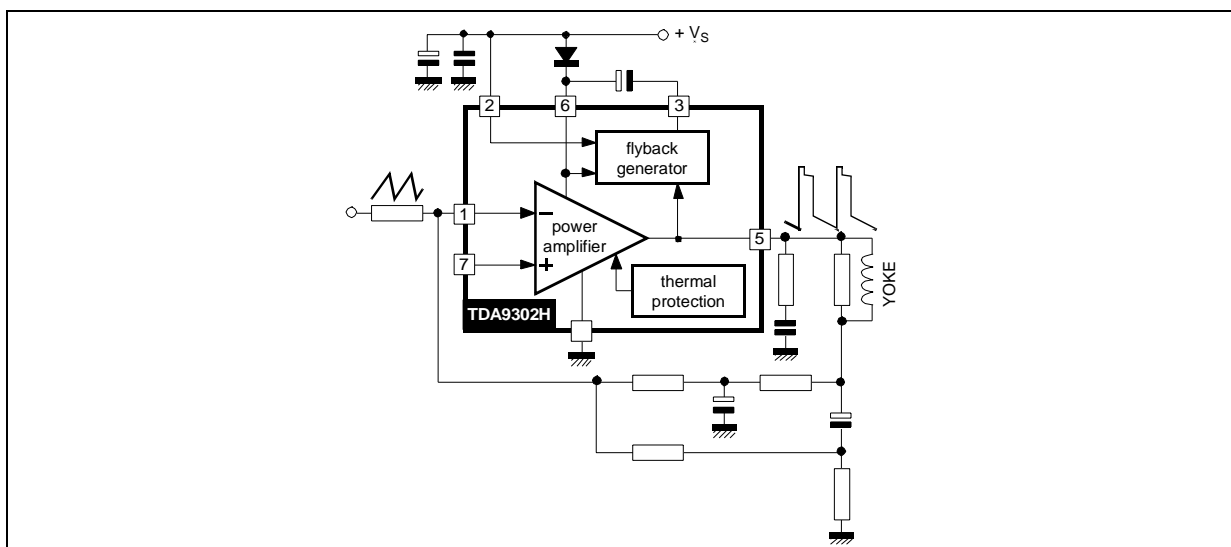
The TDA9302H is a monolithic integrated circuit in Heptawatt™ package. It is a high efficiency power booster for direct driving of vertical windings of TV yokes. It is intended for use in color and black & white television as well as in monitors and displays.



PIN CONNECTION (top view)



BLOCK DIAGRAM



1 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 (see Note 1) | $V_S + 3$ | V |
| V_1, V_7 | Amplifier Input Voltage | $V_S - 0.5$ | V |
| I_0 | Output Peak Current (non repetitive, $t = 2\text{ms}$) | 1.8 | A |
| I_0 | Output Peak Current at $f = 50$ to 200 Hz, $t \leq 10\mu\text{s}$ | ± 4 | A |
| I_0 | Output Peak Current at $f = 50$ to 200 Hz, $t > 10\mu\text{s}$ | 1.5 | A |
| I_3 | Pin 3 DC Current at $V_5 < V_2$ | 100 | mA |
| I_3 | Pin 3 Flyback Current at $f = 50$ to 200 Hz, $t_{fly} \leq 1.5\text{ms}$ | ± 1.5 | A |
| I_3 | Pin 3 Sink Current at $f = 50$ to 200 Hz, $t \leq 10\mu\text{s}$ | 4 | A |
| P_{tot} | Total Power Dissipation at $T_{case} = 90^\circ\text{C}$ | 20 | W |
| T_{stg}, T_j | Storage and Junction Temperature | -40, +150 | $^\circ\text{C}$ |

Note 1: This occurs during the first part of flyback pulse

2 THERMAL DATA

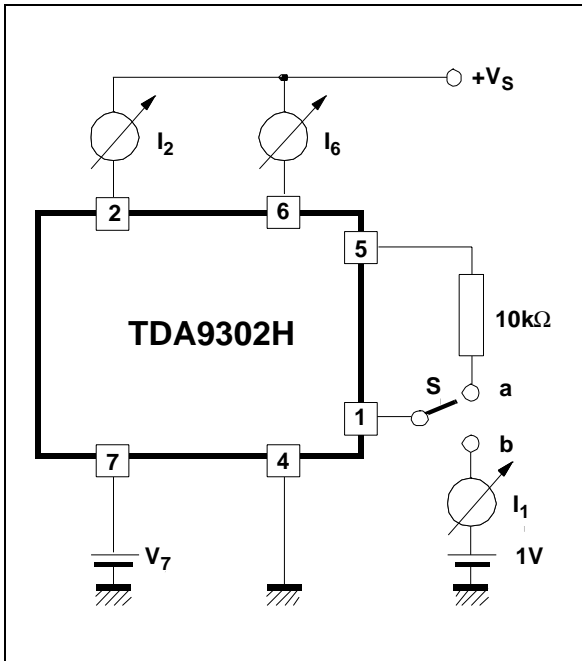
| Symbol | Parameter | Value | Unit |
|---------------|----------------------------------|-------|--------------------|
| $R_{th(j-c)}$ | Thermal Resistance Junction-case | 3 | $^\circ\text{C/W}$ |

3 ELECTRICAL CHARACTERISTICS

(refer to the test circuits, $V_S = 35\text{V}$, $T_{amb} = 25^\circ\text{C}$ 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 | 1 |
| I_6 | Pin 6 Quiescent Current | $I_3 = 0, I_5 = 0$ | | 16 | 36 | mA | 1 |
| I_1 | Amplifier Input Bias Current | $V_1 = 1\text{ V}, V_7 = 2\text{ V}$ | | -0.1 | -1 | μA | 1 |
| | | $V_1 = 2\text{ V}, V_7 = 1\text{ V}$ | | -0.1 | -1 | μA | 1 |
| V_{3L} | Pin 3 Saturation Voltage to GND | $I_3 = 20\text{ mA}$ | | 1 | 1.5 | V | 3 |
| V_5 | Quiescent Output Voltage | $V_S = 35\text{V}, R_a = 39\text{ k}\Omega$ | | 18 | | V | 4 |
| V_{5L} | Output Saturation Voltage to GND | $I_5 = 1\text{ A}$ | | 0.9 | 1.3 | V | 3 |
| | | $I_5 = 0.7\text{ A}$ | | 0.7 | 1 | V | 3 |
| V_{5H} | Output Saturation Voltage to Supply | $-I_5 = 1\text{ A}$ | | 1.5 | 2 | V | 2 |
| | | $-I_5 = 0.7\text{ A}$ | | 1.3 | 1.8 | V | 2 |
| T_j | Junction Temperature for Thermal Shutdown | | | 140 | | $^\circ\text{C}$ | |

Figure 1. Measurement of I_1, I_2, I_6



S1: (a) I_2 and I_6 ; (b) I_1

Figure 2. Measurement of V_{5H}

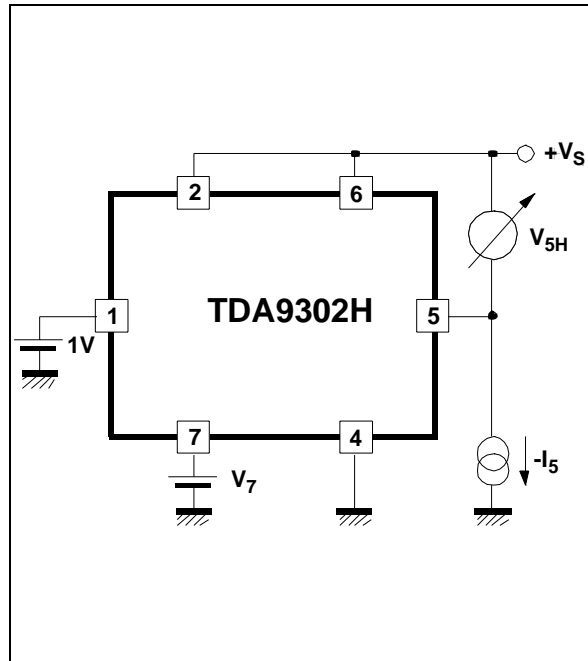
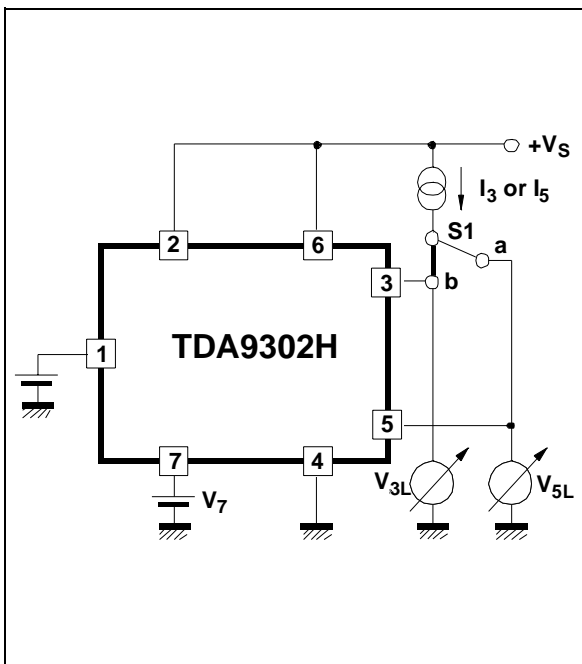


Figure 3. Measurement of V_{3L}, V_{5L}



S: (a) V_{3L} ; (b) V_{5L}

Figure 4. Measurement of V_5

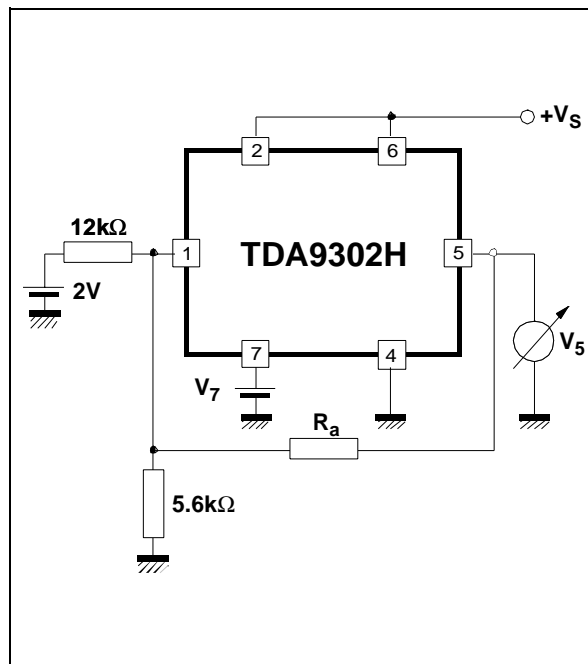
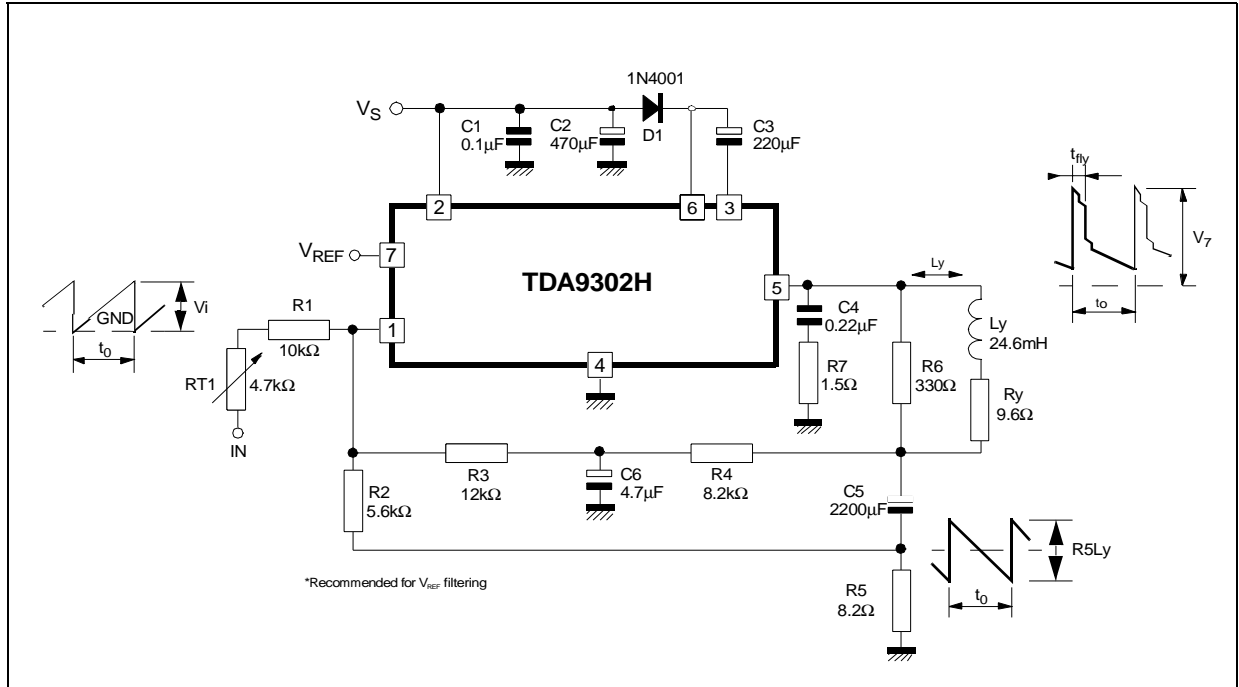


Figure 5. AC test circuit

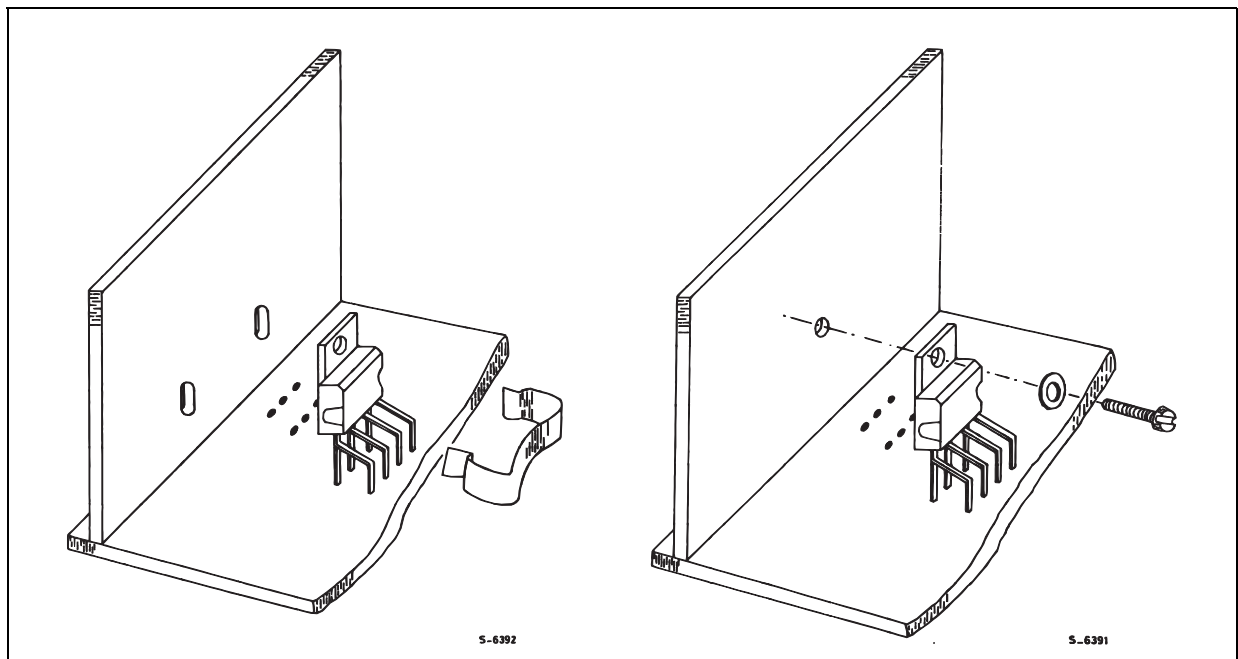


4 MOUNTING INSTRUCTIONS

The power dissipated in the circuit is removed by adding an external heatsink. With the HEPTAWATT™ package, the heatsink is simply attached with a screw or a compression spring (clip).

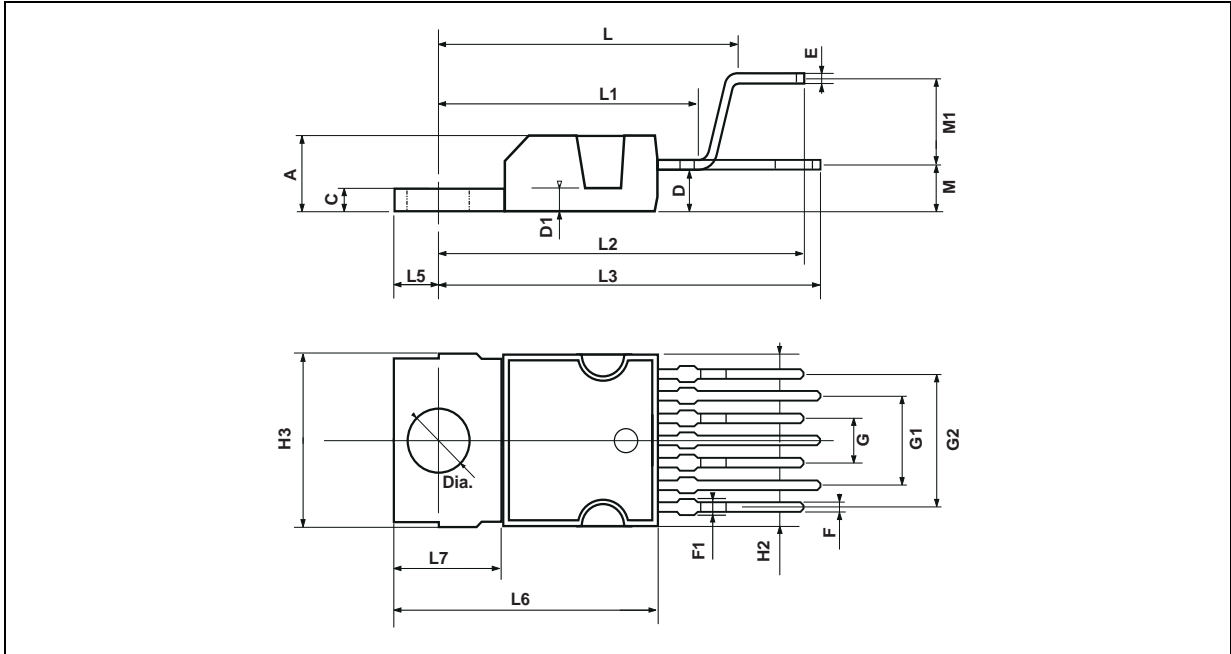
A layer of silicon grease inserted between heatsink and package optimizes thermal contact ; no electrical isolation is needed between the two surfaces since the tab is connected to Pin 4 which is ground.

Figure 6. Mounting examples



5 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 | | 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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