# TDA8177F

## Vertical deflection booster

## Features

- Power amplifier
- Thermal protection
- Output current up to 3.0 App
- Flyback voltage up to 70 V (on pin 5)
- Suitable for DC coupling applications
- External flyback supply

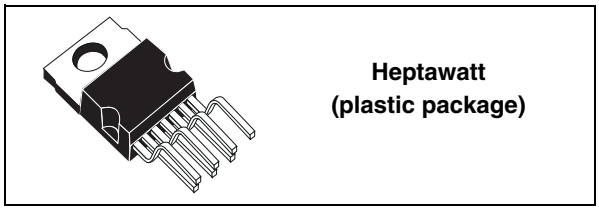
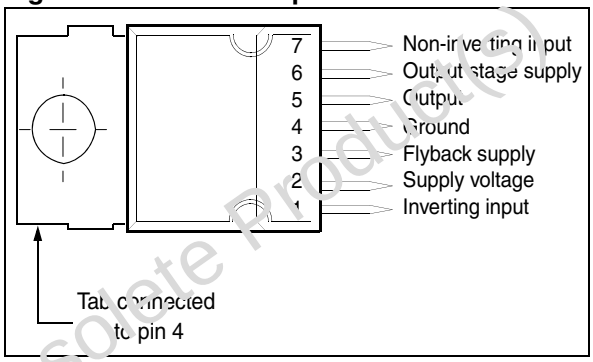



**Figure 1. TDA8177F pin detail**

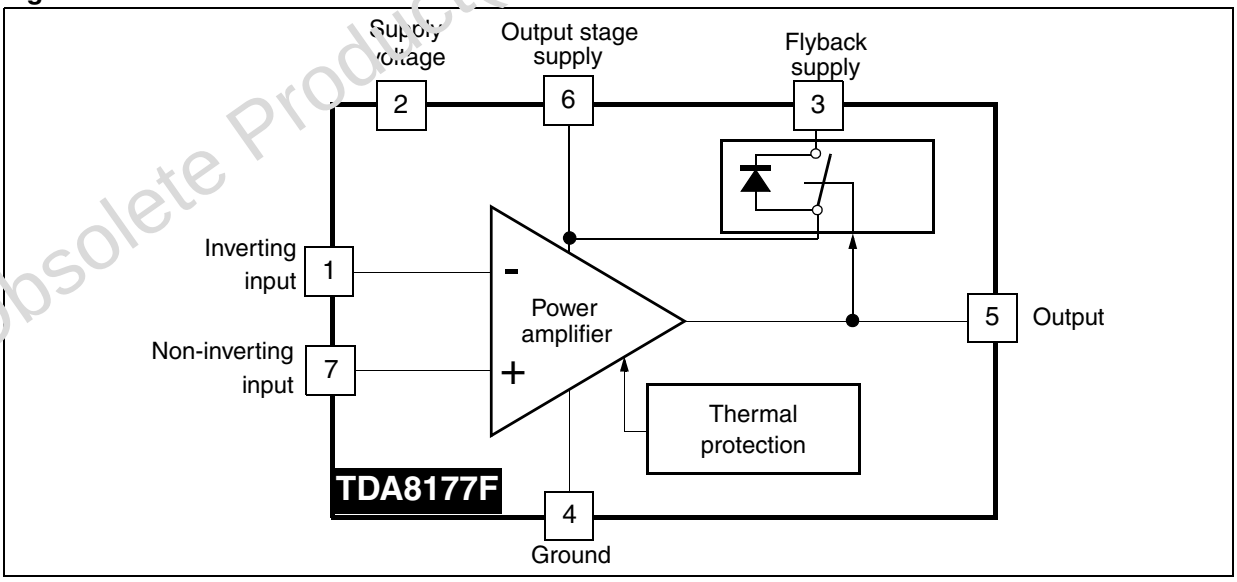



## Description

Designed for monitors and high performance TVs, the TDA8177F vertical delfection booster can handle flyback voltages of up to 70 V. In addition, it is possible to have a flyback voltage which is more than double that of the supply (pin 2). This allows decreasing power consumption or decreasing the flyback time for a given supply voltage.

The TDA8177F operates with supplies of up to 35V and outputs up to 3.0 App to drive the yoke. The TDA8177F is offered in Heptawatt packaging.

**Figure 2. TDA8177F schematic**



# Contents

# 1 Absolute maximum ratings

**Table 1. Absolute maximum ratings**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_S$ | Supply voltage (pin 2)(1) | 40 | V |
| $V_6$ | Flyback peak voltage (pin 6)(1) | 75 | V |
| $V_1$, $V_7$ | Amplifier input voltage (pins 1-7) (1) | -0.3, + $V_S$ | V |
| $I_0$ | Output peak current (2) and (3) | 2.5 | A |
| $I_3$ | Maximum sink current (<1ms) | 2.5 | A |
| $I_3$ | Maximum source current (t<1ms) (in the diode, see *Figure 3*) | 2.5 | A |
| $V_{ESD1}$ | ESD susceptibility tool model (4) | 300 | V |
| $V_{ESD2}$ | Human model (5) | 2 | kV |
| $V_3$ - $V_2$ | Voltage difference between flyback supply and supply voltage | 50 | V |
| $V_3$, $V_5$, $V_6$ | Minimum voltage (1) | -0.4 | V |
| $T_{OPER}$ | Operating ambient temperature | -20, +75 | °C |
| $T_s$ | Storage temperature | -40 to +150 | °C |
| $T_j$ | Junction temperature | +150 | °C |

1. Versus pin 4.
2. The output current can reach 4 A peak for t ≤10µs (up to 120 Hz).
3. Provided SOAR is respected (see *Figure 4* and *Figure 5*).
4. Equivalent to discharging 200pF capacitor through 0kΩ series resistor.
5. Equivalent to discharging 150pF capacitor through 1.5kΩ series resistor.

# 2 Thermal data

**Table 2. Thermal data**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $R_{thJC}$ | Junction-to-case thermal resistance | 3 | °C/W |
| $T_t$ | Temperature for thermal shutdown | 150 | °C |
| $\Delta T_t$ | Hysteresis on $T_t$ | 10 | °C |
| $T_{jr}$ | Recommended max. junction temperature | 120 | °C |

# 3 Electrical characteristics

$V_S$ = 35 V, $T_{AMB}$ = 25°C, unless otherwise specified.

**Table 3. Electrical characteristics**

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_S$ | Operating supply voltage range | | 10 | | 35 | V |
| $V_{3M}$ | Operating flyback supply voltage | | $V_S$ | | 70 | V |
| $I_2$ | Pin 2 quiescent current | $I_3$ = 0, $I_5$ = 0 | | 10 | 20 | mA |
| $I_6$ | Pin 6 quiescent current | $I_3$ = 0, $I_5$ = 0, | | 25 | 35 | mA |
| $I_0$ | Maximum scanning peak output current | | | | 1.5 | A |
| $I_1$ | Amplifier bias current | $V_1$ = 20 V, $V_7$ = 21 V | | -0.4 | -2 | µA |
| $I_7$ | Amplifier bias current | $V_1$ = 21 V, $V_7$ = 20 V | | -0.4 | -2 | µA |
| $V_{I0}$ | Offset voltage | | | 0 | 7 | mV |
| $\Delta V_{I0}/dt$ | Offset drift versus temperature | | | -10 | | µV/°C |
| GV | Voltage gain | | 80 | | | dB |
| $V_{5L}$ | Output saturation voltage to ground (pin 4) | $I_5$ = 1.5 A | | 1.0 | 2 | V |
| $V_{5H}$ | Output saturation voltage to supply (pin 6) | $I_5$ = -1.5 A | | 1.7 | 2.5 | V |
| $V_{D5-6}$ | Diode forward voltage between pins 5-6 | $I_5$ = 1.5 A | | 1.5 | 2.1 | V |
| $V_{D3-6}$ | Diode forward voltage between pins 3-6 | $I_3$ = 1.5 A | | 2.3 | 3 | V |
| $V_{3-6}$ | Voltage drop between pins 3-6 ($2^{nd}$ part of flyback) | $I_3$ = -1A | | 4 | 5 | V |

**Figure 3. DC-coupled application**

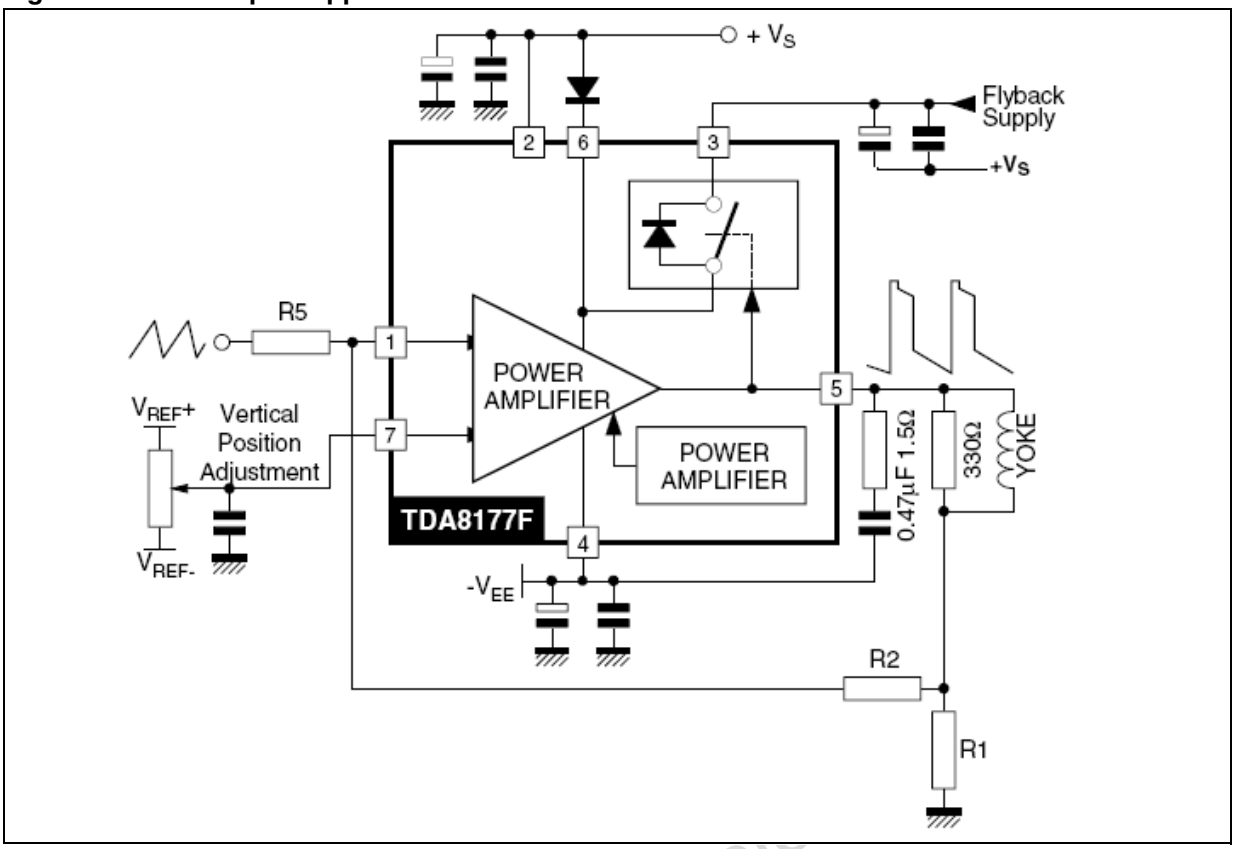



**Figure 4. Output transistor safe operating area (SOA) for secondary breakdown**

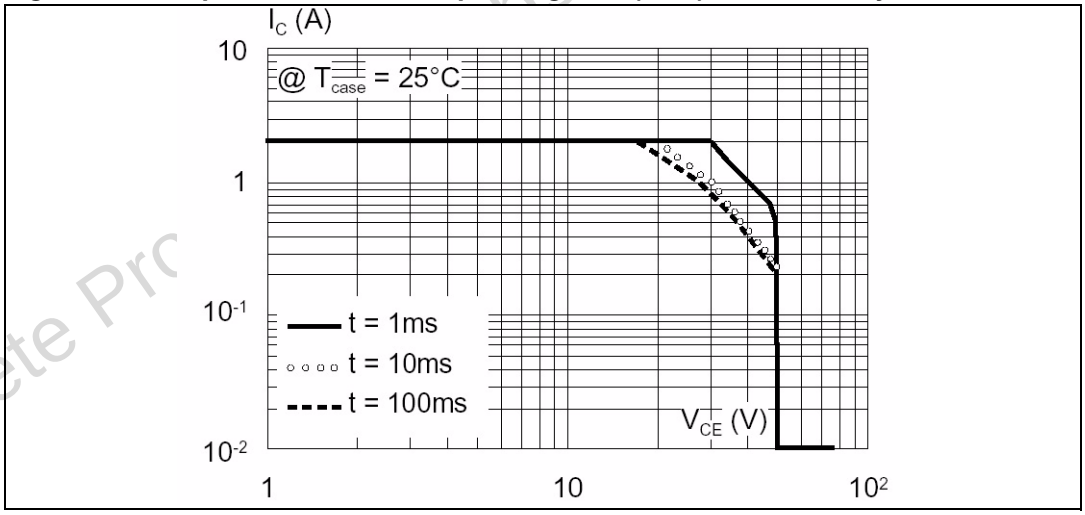
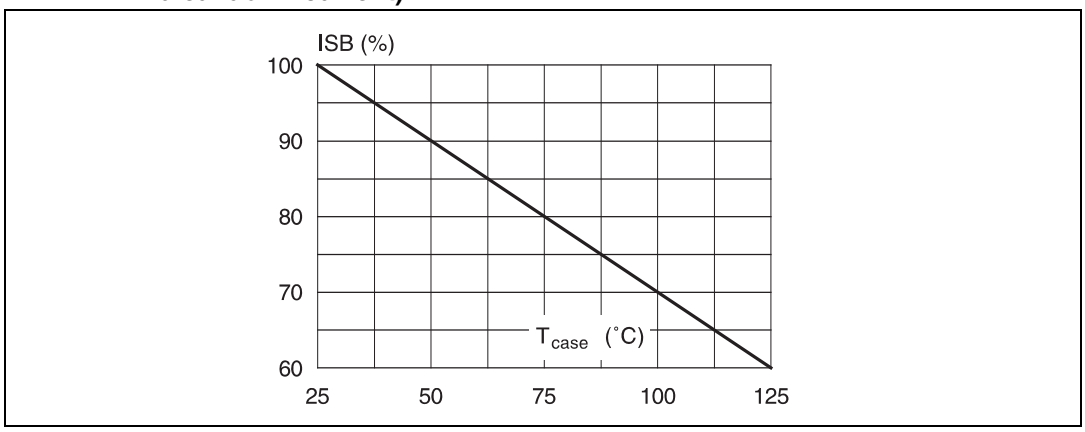


**Figure 5. Secondary breakdown temperature derating curve (ISB = secondary breakdown current)**



# 4 Order codes

**Table 4. Ordering information**

| Order code | Package | Temperature range |
|---|---|---|
| TDA8177F | Heptawatt 7 | -25 to 85 °C |

# 5 Package mechanical data

**Figure 6. 7-pin Heptawatt package**

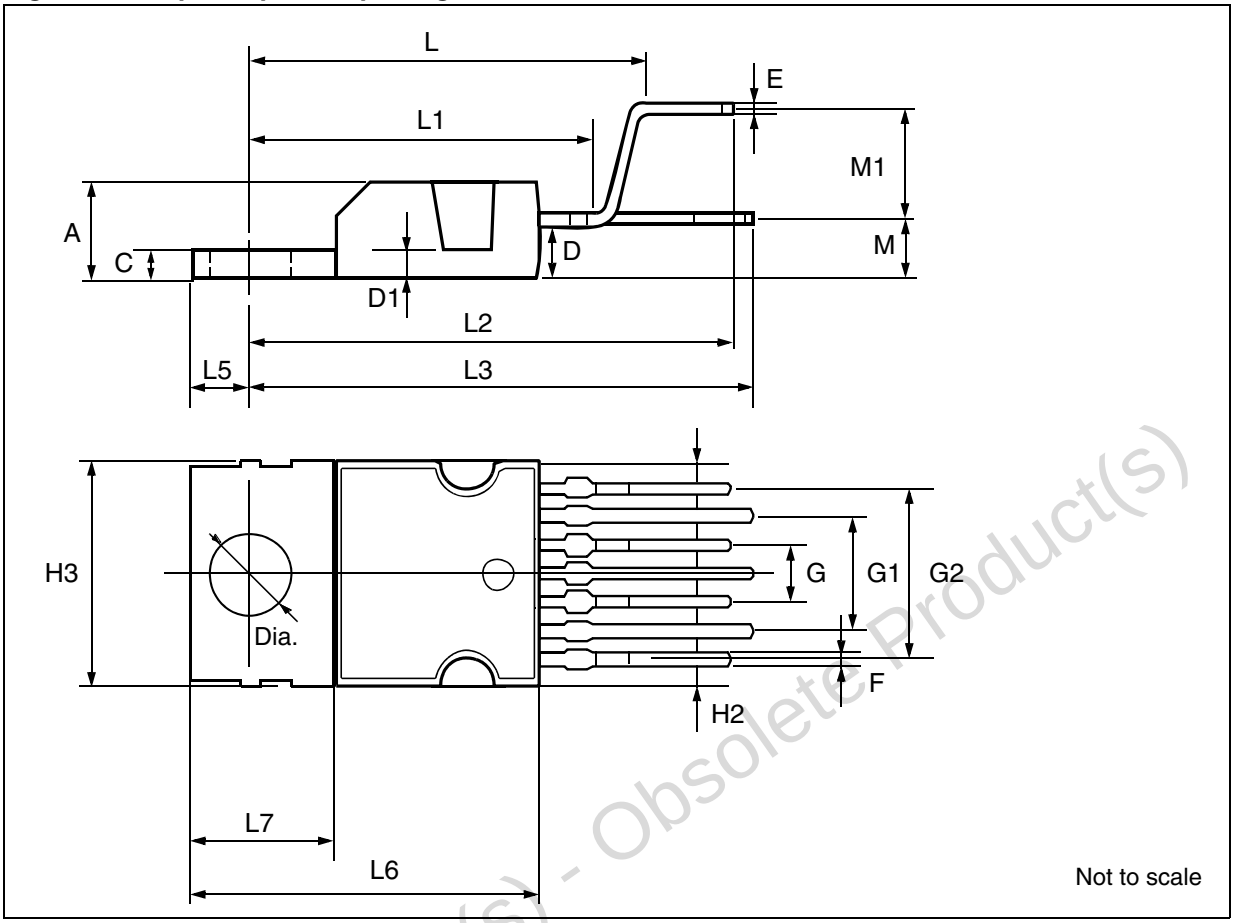



**Table 5. Heptawatt package**

| Dim. | mm | | | inches | | |
|---|---|---|---|---|---|---|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | | 4.8 | | | 0.189 |
| C | | | 1.37 | | | 0.054 |
| D | 2.40 | | 2.80 | 0.094 | | 0.110 |
| D1 | 1.20 | | 1.35 | 0.047 | | 0.053 |
| E | 0.35 | | 0.55 | 0.014 | | 0.022 |
| F | 0.60 | | 0.80 | 0.024 | | 0.031 |
| G | 2.41 | 2.54 | 2.67 | 0.095 | 0.100 | 0.105 |

Table 5. Heptawatt package (continued)

| Dim. | mm | | | inches | | |
|---|---|---|---|---|---|---|
| G1 | 4.91 | 5.08 | 5.21 | 0.193 | 0.200 | 0.205 |
| G2 | 7.49 | 7.62 | 7.80 | 0.295 | 0.300 | 0.307 |
| H2 | | | 10.40 | | | 0.409 |
| H3 | 10.05 | | 10.40 | 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 | 2.60 | 2.80 | 3.00 | 0.102 | | 0.118 |
| L6 | 15.10 | | 15.80 | 0.594 | | 0.622 |
| L7 | 6.00 | | 6.60 | 0.0236 | | 0.260 |
| M | | 2.80 | | | 0.110 | |
| M1 | | 5.08 | | | 0.200 | |
| Dia. | 3.65 | | 3.85 | 0.144 | | 0.152 |

## 5.1 Environmentally-friendly packages

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance.

ECOPACK specifications, grade definitions and product status are available at: *www.st.com.* ECOPACK is an ST trademark.

# 6 Revision history

Table 6. Document revision history

| Date | Revision | Changes |
|---|---|---|
| April 2005 | 1 | First issue. |
| 17-Jan-2007 | 2 | Stylesheet update. No content change. |
| 11-Dec-2008 | 3 | *Section 5.1* added, new template applied. |

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