



Figure 3. Block Diagram

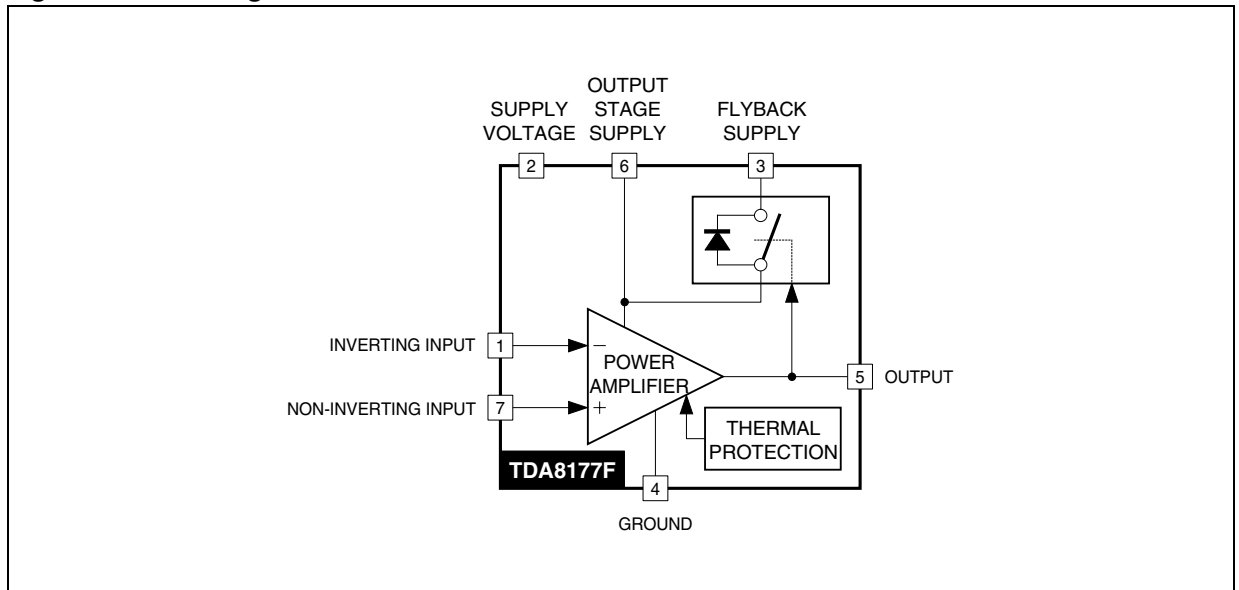


Table 1. Absolute Maximum Ratings

| Symbol          | Parameter                                                              | Value        | Unit |
|-----------------|------------------------------------------------------------------------|--------------|------|
| $V_S$           | Supply Voltage (Pin 2) (see note 1)                                    | 40           | V    |
| $V_6$           | Flyback Peak Voltage (Pin 6) (see note 1)                              | 75           | V    |
| $V_1, V_7$      | Amplifier Input Voltage (Pins 1-7) (see note 1)                        | $-0.3, +V_S$ | V    |
| $I_O$           | Maximum Output Peak Current (see notes 2 and 3)                        | 2.5          | A    |
| $I_3$           | Maximum Sink Current ( $t < 1$ ms)                                     | 2.5          | A    |
| $I_3$           | Maximum Source Current ( $t < 1$ ms) (in the diode, see Block Diagram) | 2.5          | A    |
| $V_{ESD1}$      | ESD Susceptibility Tool Model (see note 4)                             | 300          | V    |
| $V_{ESD2}$      | Human Model (see note 5)                                               | 2            | kV   |
| $V_3 - V_2$     | Voltage Difference between Flyback Supply and Supply Voltage           | 50           | V    |
| $V_3, V_5, V_6$ | Min. Voltage (see note 1)                                              | -0.4         | V    |
| $T_{OPER}$      | Operating Ambient Temperature                                          | -20, +75     | °C   |
| $T_{STG}$       | Storage Temperature                                                    | -40, +150    | °C   |
| $T_j$           | Junction Temperature                                                   | +150         | °C   |

- Note: 1. Versus Pin 4.  
 2. The output current can reach 4A peak for  $t \leq 10\mu s$  (up to 120Hz).  
 3. Provided SOAR is respected (see Figures 6 and 7).  
 4. Equivalent to discharging a 200pF capacitor through a 0kΩ series resistor.  
 5. Equivalent to discharging a 150pF capacitor through a 1.5kΩ series resistor.

**Table 2. Thermal Data**

| Symbol        | Parameter                             | Value | Unit |
|---------------|---------------------------------------|-------|------|
| $R_{th(j-c)}$ | Junction-case Thermal Resistance Max  | 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   |

**Table 3. Electrical Characteristics**(V<sub>S</sub> = 35V, T<sub>A</sub> = 25°C, unless otherwise specified)

| Symbol             | Parameter                                           | Test Conditions                            | Min.           | Typ.  | Max. | Unit  |
|--------------------|-----------------------------------------------------|--------------------------------------------|----------------|-------|------|-------|
| V <sub>S</sub>     | Operating Supply Voltage Range                      |                                            | 10             |       | 35   | V     |
| V <sub>3M</sub>    | Operating Flyback Supply Voltage                    |                                            | V <sub>S</sub> |       | 70   | V     |
| I <sub>2</sub>     | Pin 2 Quiescent Current                             | I <sub>3</sub> = 0, I <sub>5</sub> = 0     |                | 10    | 20   | mA    |
| I <sub>6</sub>     | Pin 6 Quiescent Current                             | I <sub>3</sub> = 0, I <sub>5</sub> = 0     |                | 25    | 35   | mA    |
| I <sub>O</sub>     | Max. Scanning Peak Output Current                   |                                            |                |       | 1.5  | A     |
| I <sub>1</sub>     | Amplifier Bias Current                              | V <sub>1</sub> = 20V, V <sub>7</sub> = 21V |                | - 0.4 | - 2  | μA    |
| I <sub>7</sub>     | Amplifier Bias Current                              | V <sub>1</sub> = 21V, V <sub>7</sub> = 20V |                | - 0.4 | - 2  | μA    |
| V <sub>IO</sub>    | Offset Voltage                                      |                                            |                | 0     | 7    | mV    |
| $\Delta V_{IO}/dt$ | Offset Drift versus Temperature                     |                                            |                | - 10  |      | μV/°C |
| GV                 | Voltage Gain                                        |                                            | 80             |       |      | dB    |
| V <sub>5L</sub>    | Output Saturation Voltage to GND (Pin 4)            | I <sub>5</sub> = 1.5A                      |                | 1.0   | 2    | V     |
| V <sub>5H</sub>    | Output Saturation Voltage to Supply (Pin 6)         | I <sub>5</sub> = - 1.5A                    |                | 1.7   | 2.5  | V     |
| V <sub>D5-6</sub>  | Diode Forward Voltage between Pins 5-6              | I <sub>5</sub> = 1.5A                      |                | 1.5   | 2.1  | V     |
| V <sub>D3-6</sub>  | Diode Forward Voltage between Pins 3-6              | I <sub>3</sub> = 1.5A                      |                | 2.3   | 3    | V     |
| V <sub>3-6</sub>   | Voltage Drop between Pins 3-6 (2nd part of flyback) | I <sub>3</sub> = - 1.A                     |                | 4     | 5    | V     |



Figure 5. DC Coupling

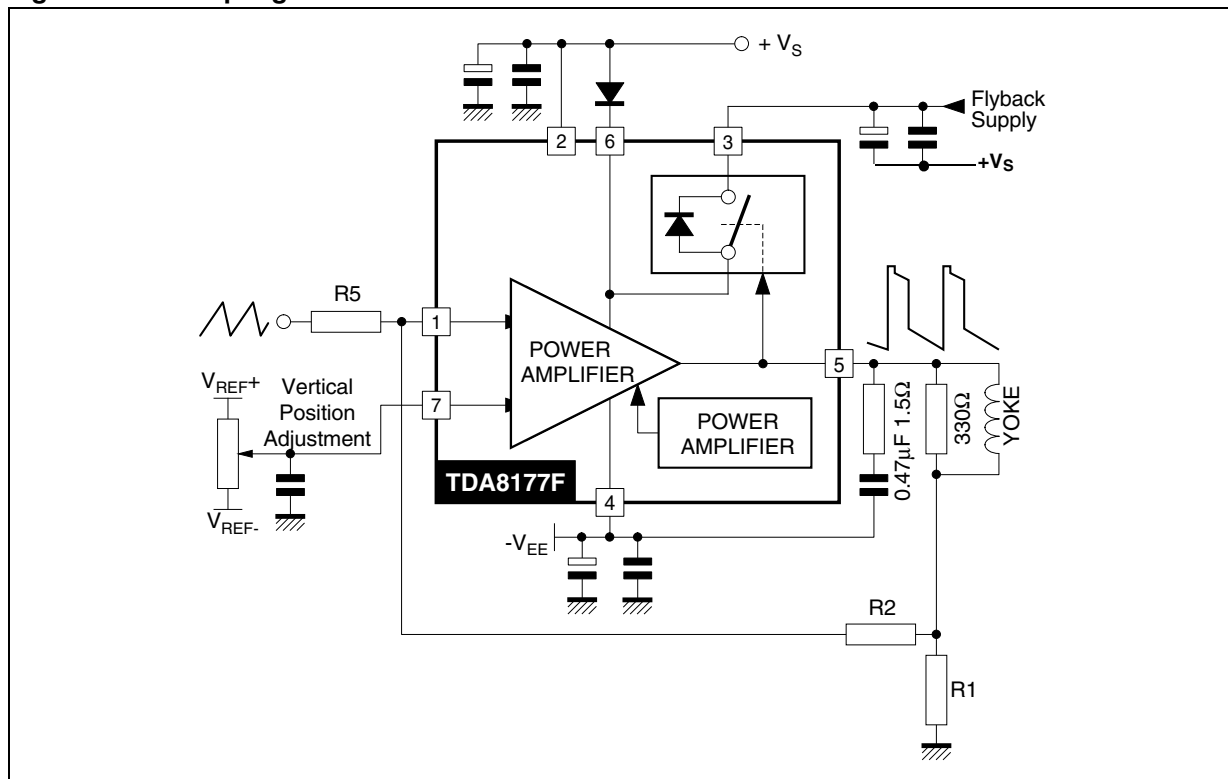


Figure 6. Output Transistors SOA (for secondary breakdown)

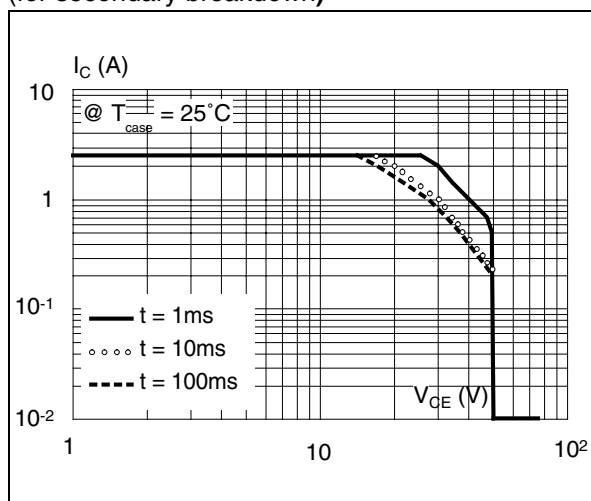
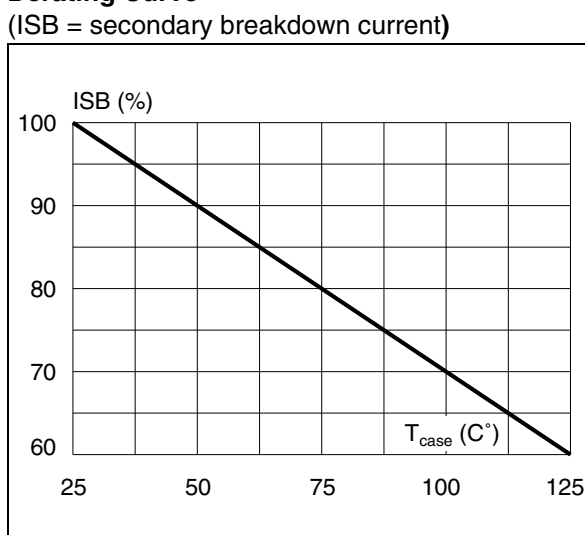


Figure 7. Secondary Breakdown Temperature Derating Curve



**PART NUMBERING****Table 4. Order Codes**

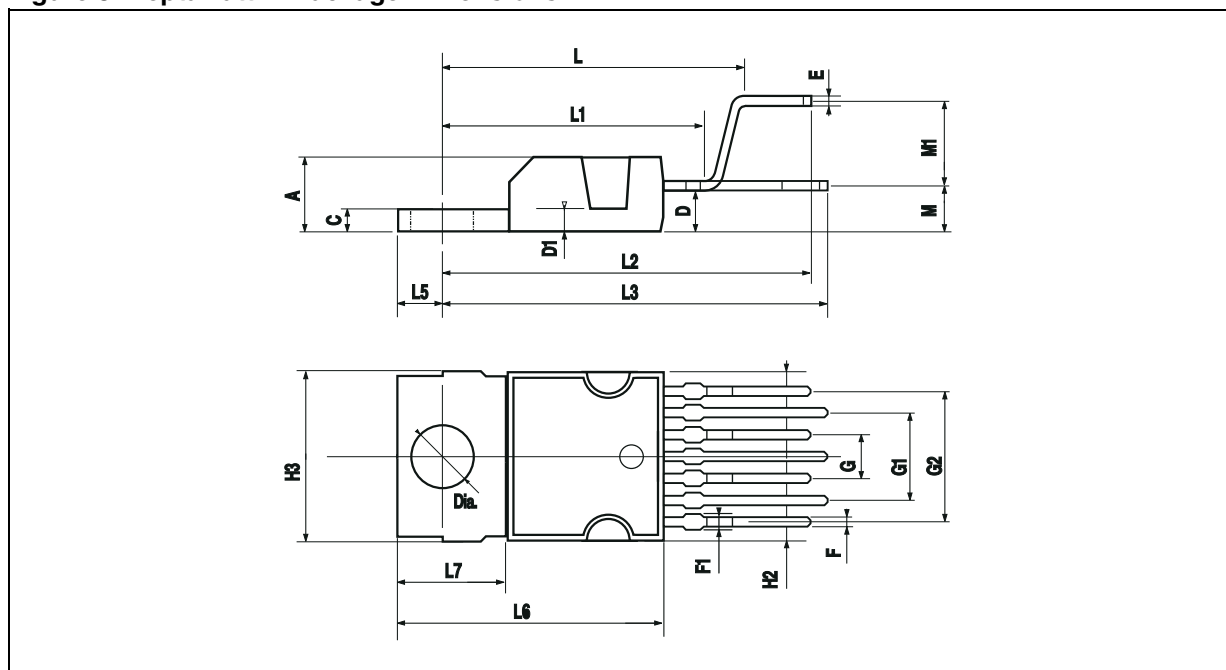
| <b>Part Number</b> | <b>Package</b> | <b>Temperature Range</b> |
|--------------------|----------------|--------------------------|
| TDA8177F           | HEPTAWATT7     | -25 to 85°C              |

## PACKAGE MECHANICAL DATA

Table 5. Heptawatt7 - Mechanical Data

| Symbol | 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 |

Figure 8. Heptawatt7 - Package Dimensions



Note: Drawing is not to scale

**REVISION HISTORY****Table 6. Revision History**

| <b>Date</b>   | <b>Revision</b> | <b>Description of Changes</b>         |
|---------------|-----------------|---------------------------------------|
| December-1998 | 1               | First Issue                           |
| 29-Mar-2005   | 2               | Stylesheet update. No content change. |

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics.

All other names are the property of their respective owners.

© 2005 STMicroelectronics - All rights reserved

STMicroelectronics GROUP OF COMPANIES

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States

[www.st.com](http://www.st.com)