

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

Description

Designed for monitors and high performance TVs, the TDA8177F vertical deflection 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.

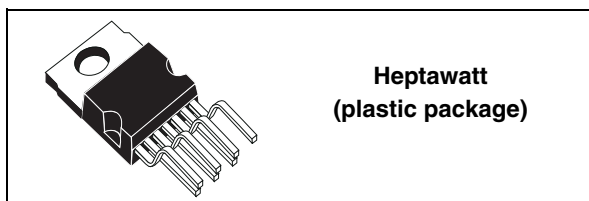


Figure 1. TDA8177F pin detail

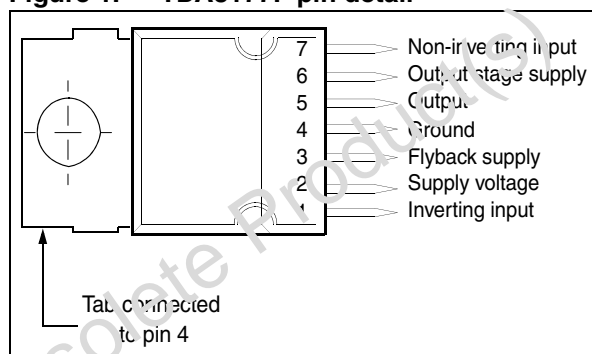
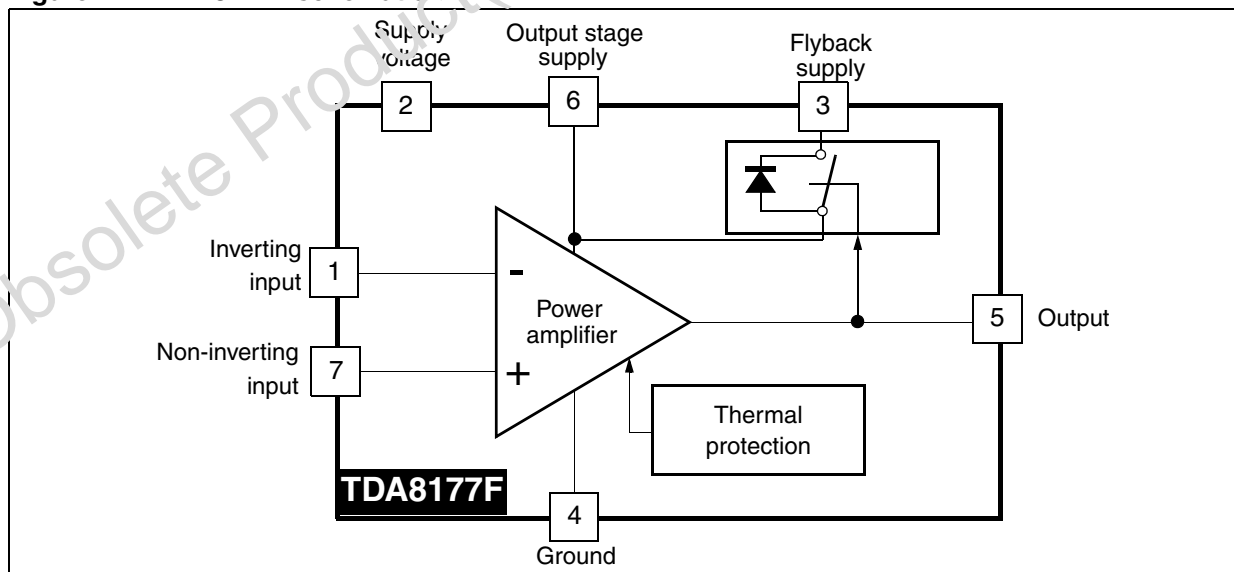


Figure 2. TDA8177F schematic



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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 $t \leq 10\mu s$ (up to 120 Hz).
3. Provided SOAR is respected (see [Figure 4](#) and [Figure 5](#)).
4. Equivalent to discharging 200pF capacitor through 0k Ω series resistor.
5. Equivalent to discharging 150pF capacitor through 1.5k Ω 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
ΔT_t	Hysteresis on T_t	10	°C
T_{jr}	Recommended max. junction temperature	120	°C

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3 Electrical characteristics

$V_S = 35\text{ V}$, $T_{AMB} = 25^\circ\text{C}$, 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	$V_1 = 20\text{ V}$, $V_7 = 21\text{ V}$		-0.4	-2	μA
I_7	Amplifier bias current	$V_1 = 21\text{ V}$, $V_7 = 20\text{ V}$		-0.4	-2	μA
V_{I0}	Offset voltage			0	7	mV
$\Delta V_{I0}/dt$	Offset drift versus temperature			-10		$\mu\text{V}/^\circ\text{C}$
GV	Voltage gain		80			dB
V_{5L}	Output saturation voltage to ground (pin 4)	$I_5 = 1.5\text{ A}$		1.0	2	V
V_{5H}	Output saturation voltage to supply (pin 6)	$I_5 = -1.5\text{ A}$		1.7	2.5	V
V_{D5-6}	Diode forward voltage between pins 5-6	$I_5 = 1.5\text{ A}$		1.5	2.1	V
V_{D3-6}	Diode forward voltage between pins 3-6	$I_3 = 1.5\text{ A}$		2.3	3	V
V_{3-6}	Voltage drop between pins 3-6 (2 nd part of flyback)	$I_3 = -1\text{ A}$		4	5	V

Figure 3. DC-coupled application

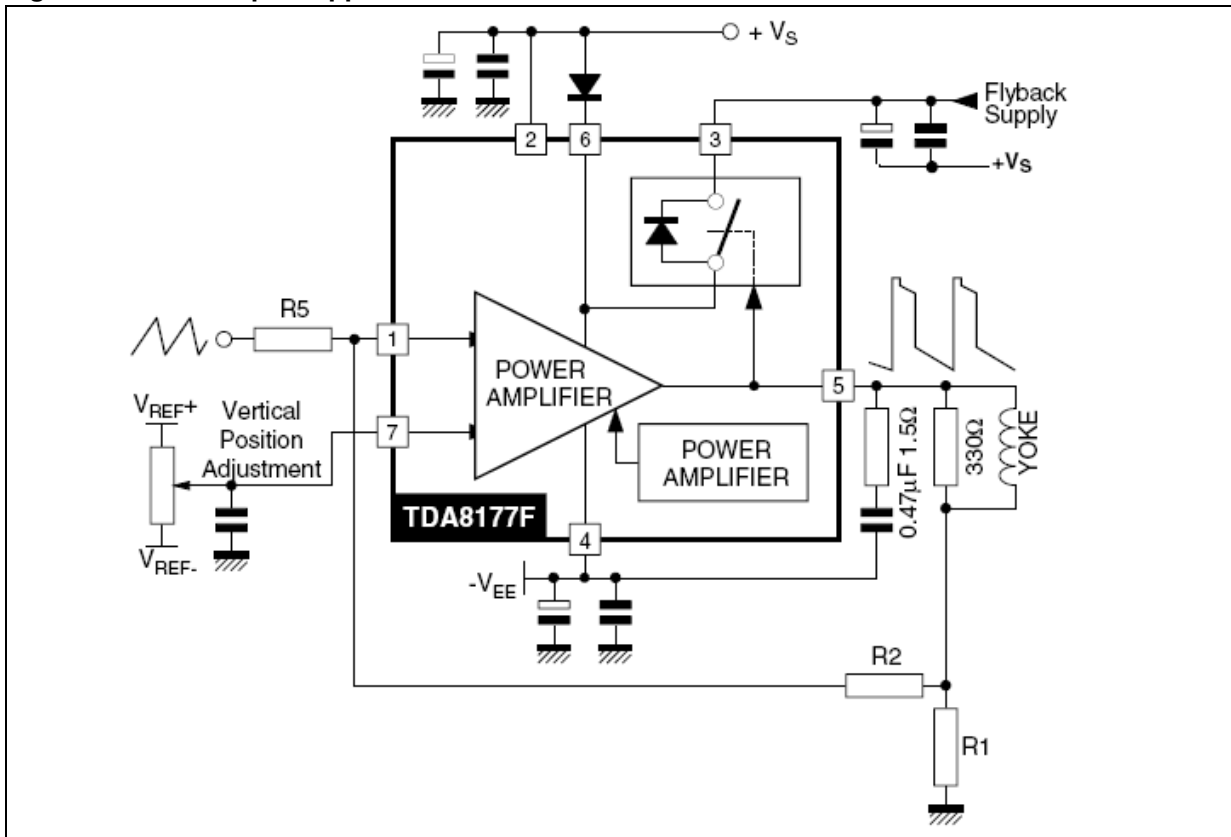


Figure 4. Output transistor safe operating area (SOA) for secondary breakdown

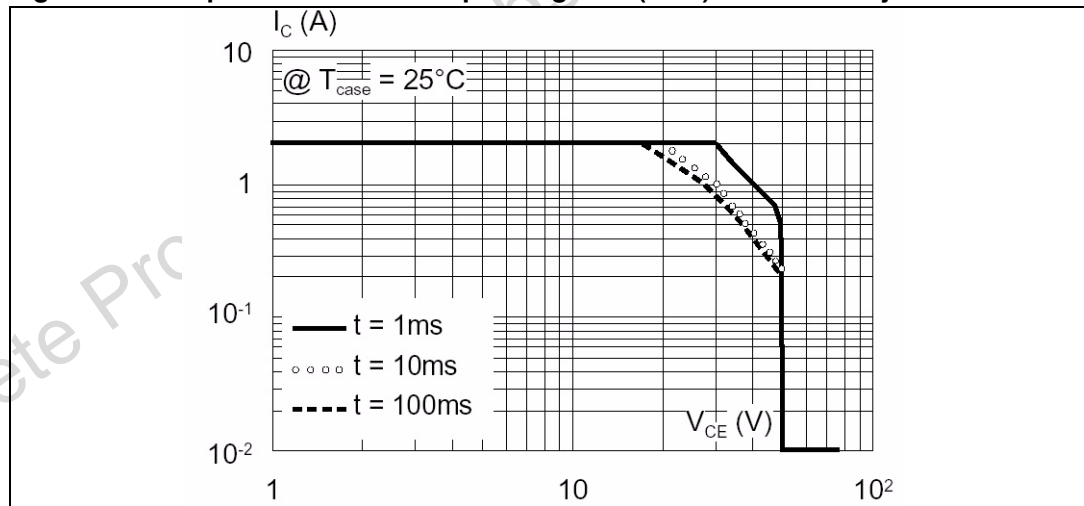
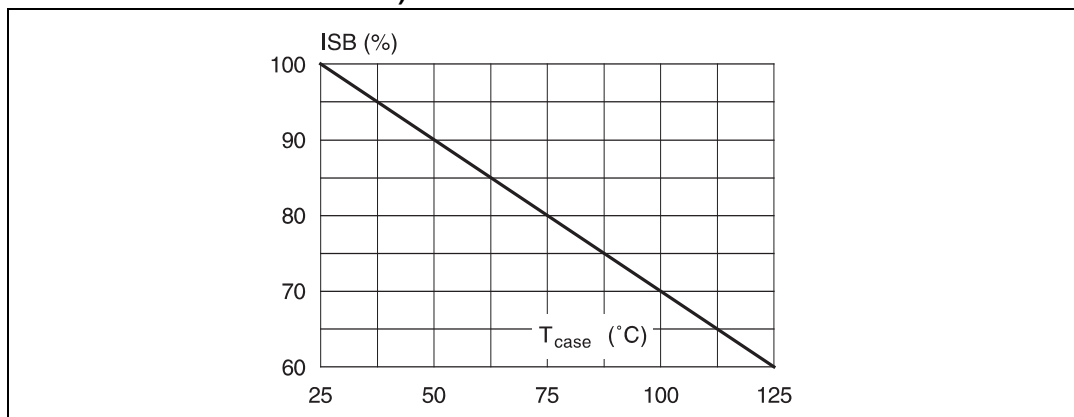


Figure 5. Secondary breakdown temperature derating curve (ISB = secondary breakdown current)



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4 Order codes

Table 4. Ordering information

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

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5 Package mechanical data

Figure 6. 7-pin Heptawatt package

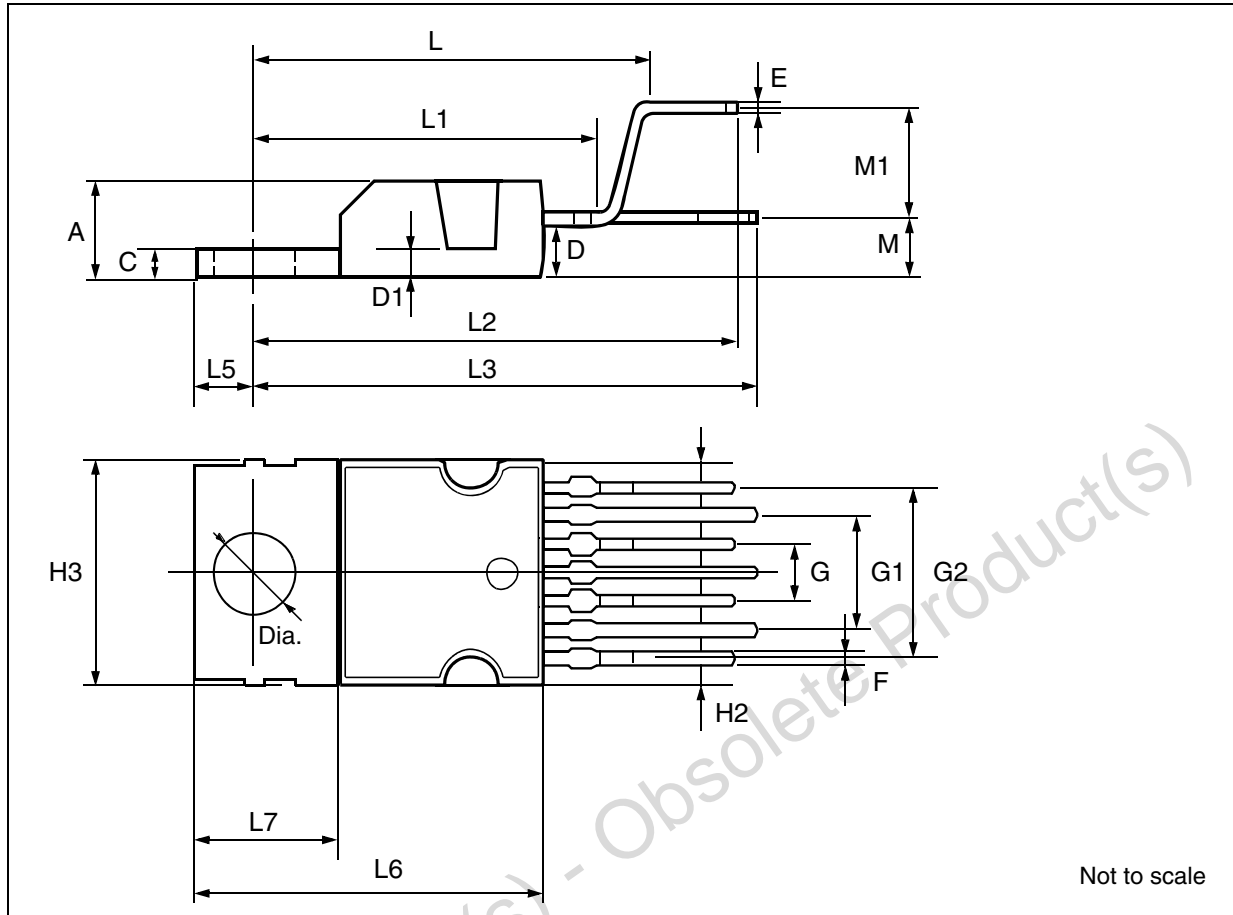


Table 5. Heptawatt package

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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