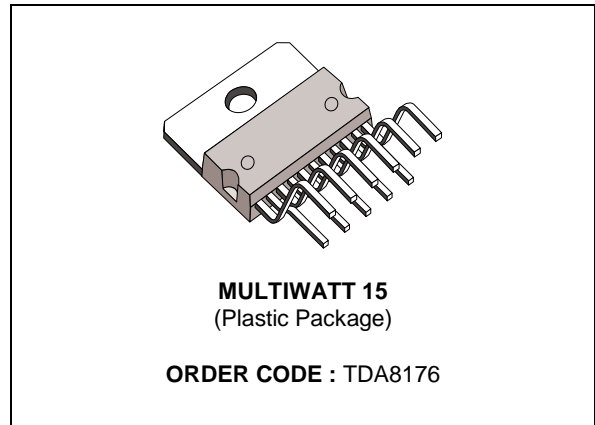


**TV VERTICAL DEFLECTION SYSTEM  
FOR TV AND MONITORS**

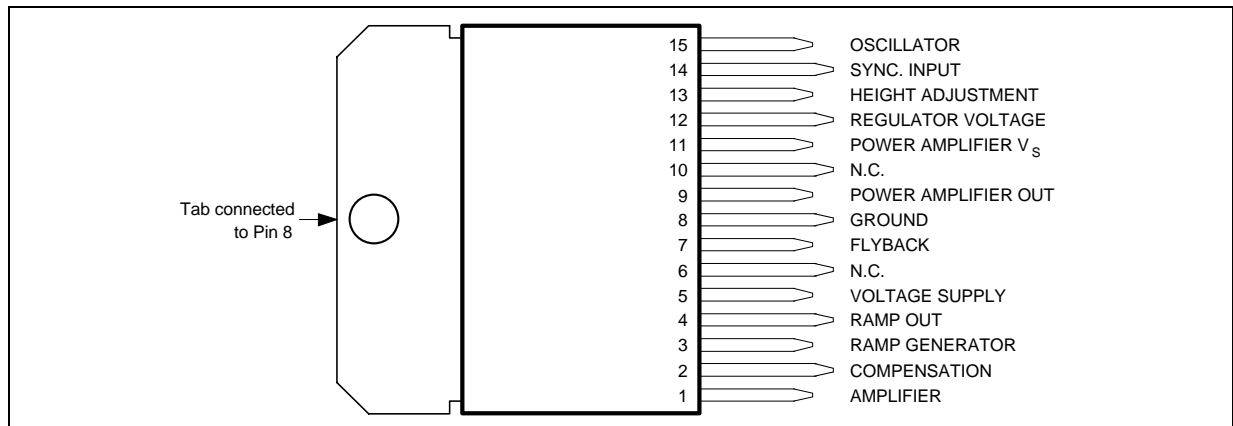
- SYNCHRONIZATION CIRCUIT
- OSCILLATOR AND RAMP GENERATOR
- HIGH POWER GAIN AMPLIFIER
- FLYBACK GENERATOR
- VOLTAGE REGULATOR



**DESCRIPTION**

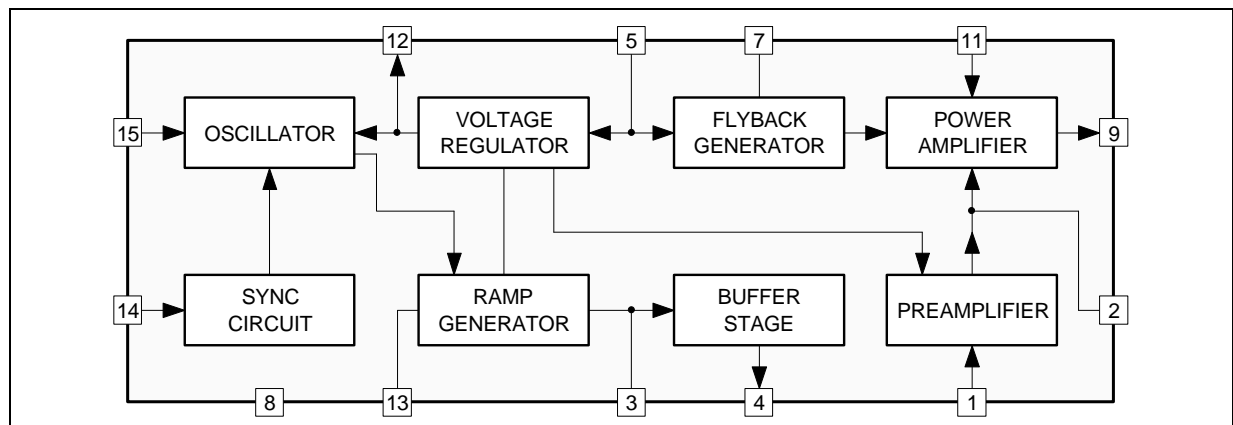
The TDA8176 is a monolithic integrated circuit in Multiwatt 15 package. It is intended for use in color TV sets and monitors.

**PIN CONNECTIONS**



8176-01.EPS

**BLOCK DIAGRAM**



8176-02.EPS

## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V <sub>5</sub>	Supply Voltage at Pin 2	35	V
V <sub>4</sub> , V <sub>5</sub>	Flyback Peak Voltage	60	V
V <sub>10</sub>	Power Amplifier Input Voltage	+ 10 - 0.5	V V
I <sub>o</sub>	Output Peak Current (non repetitive) at t = 2 ms	2	A
I <sub>o</sub>	Output Peak Current at f = 50 Hz t ≤ 10 μs	2.5	A
I <sub>o</sub>	Output Peak Current at f = 50 Hz t > 10 μs	1.5	A
I <sub>3</sub>	Pin 3 DC Current at V <sub>4</sub> < V <sub>2</sub>	100	mA
I <sub>3</sub>	Pin 3 Peak to Peak Flyback Current for f = 50 Hz, t <sub>fly</sub> ≤ 1.5 ms	1.8	A
I <sub>8</sub>	Pin 8 Current	± 20	mA
P <sub>tot</sub>	Power Dissipation at T <sub>tab</sub> = 90 °C at T <sub>amb</sub> = 80 °C	20 1.4	W W
T <sub>stg</sub> , T <sub>j</sub>	Storage and Junction Temperature	- 40, + 150	°C

8176-01.TBL

## THERMAL DATA

Symbol	Parameter	Value	Unit
R <sub>th(j-c)</sub>	Thermal Resistance Junction-case	Max. 3	°C/W
R <sub>th(j-a)</sub>	Thermal Resistance Junction-ambient	Max. 50	°C/W

8176-02.TBL

## AC ELECTRICAL CHARACTERISTICS

(refer to the test circuit, V<sub>S</sub> = 25V ; f = 50Hz ; T<sub>amb</sub> = 25°C, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I <sub>s</sub>	Supply Current	I <sub>y</sub> = 1 App		140		mA
I <sub>14</sub>	Sync. Input Current (positive or negative)		500			μA
V <sub>9</sub>	Flyback Voltage	I <sub>y</sub> = 1 App		51		V
V <sub>15</sub>	Peak to peak Oscillator Sawtooth Voltage			2.4		V
t <sub>fly</sub>	Flyback Time	I <sub>y</sub> = 1 App		0.7		ms
f <sub>o</sub>	Free Running Frequency	(P <sub>1</sub> + R <sub>1</sub> ) = 300kΩ C <sub>2</sub> = 100 nF		44		Hz
		(P <sub>1</sub> + R <sub>1</sub> ) = 260kΩ C <sub>2</sub> = 100 nF		52		Hz
Δf	Synchronization Range	I <sub>8</sub> = 0.5 mA	14			Hz
$\frac{\Delta f}{\Delta V_S}$	Frequency Drift with Supply Voltage	V <sub>s</sub> = 10 to 35 V		0.005		Hz/V
$\left  \frac{\Delta f}{\Delta T_{tab}} \right $	Frequency Drift with Tab Temperature	T <sub>tab</sub> = 40 to 120 °C		0.01		Hz/°C

8176-03.TBL

**DC ELECTRICAL CHARACTERISTICS** ( $V_S = 35V$ ,  $T_{amb} = 25^\circ C$  unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_5$	Pin 5 Quiescent Current	$I_7 = 0$		7	14	mA
$I_{11}$	Pin 11 Quiescent Current	$I_9 = 0$		8	17	mA
$-I_{15}$	Oscillator Bias Current	$V_{15} = 1 V$		0.1	1	$\mu A$
$-I_1$	Amplifier Input Bias Current	$V_1 = 1 V$		0.1	10	$\mu A$
$-I_3$	Ramp Generator Bias Current	$V_3 = 0$		0.02	0.3	$\mu A$
$-I_3$	Ramp Generator Current	$I_{13} = 20 \mu A$ , $V_3 = 0$	18.5	20	21.5	$\mu A$
$\frac{\Delta I_3}{I_3}$	Ramp Generator Non-linearity	$\Delta V_{12} = 0$ to $12 V$ $I_{13} = 20 \mu A$		0.2	1	%
$V_S$	Supply Voltage Range		10		35	V
$V_4$	Pin 4 Saturation Voltage to Ground	$I_4 = 1 mA$		1	1.4	V
$V_7$	Pin 7 Saturation Voltage to Ground	$I_7 = 10 mA$		300	450	mV
$V_9$	Quiescent Output Voltage	$V_S = 10 V$ $R_1 = 10 k\Omega$ $R_2 = 10 k\Omega$	4.1	4.4	4.75	V
		$V_S = 35 V$ $R_1 = 30 k\Omega$ $R_2 = 10 k\Omega$	8.3	8.8	9.45	V
$V_{9L}$	Output Saturation Voltage to Ground	$-I_9 = 0.1 A$		0.9	1.2	V
		$-I_9 = 0.8 A$		1.9	2.3	V
$V_{9H}$	Output Saturation Voltage to Supply	$I_9 = 0.1 A$		1.4	2.1	V
		$I_9 = 0.8 A$		2.8	3.2	V
$V_{12}$	Regulated Voltage at Pin 12		6.1	6.5	6.9	V
$V_{13}$	Regulated Voltage at Pin 13	$I_{13} = 10 \mu A$	6.2	6.6	7	V
$\frac{\Delta V_{12}}{\Delta V_S}, \frac{\Delta V_{13}}{\Delta V_S}$	Regulated Voltage Drift with Supply Voltage	$\Delta V_S = 10$ to $35 V$		1		mV/V
$V_1$	Amplifier Input Reference Voltage		2.07	2.2	2.3	V
$R_{14}$	Pin 8 Input Resistance	$V_{14} \leq 0.4 V$	1			M $\Omega$

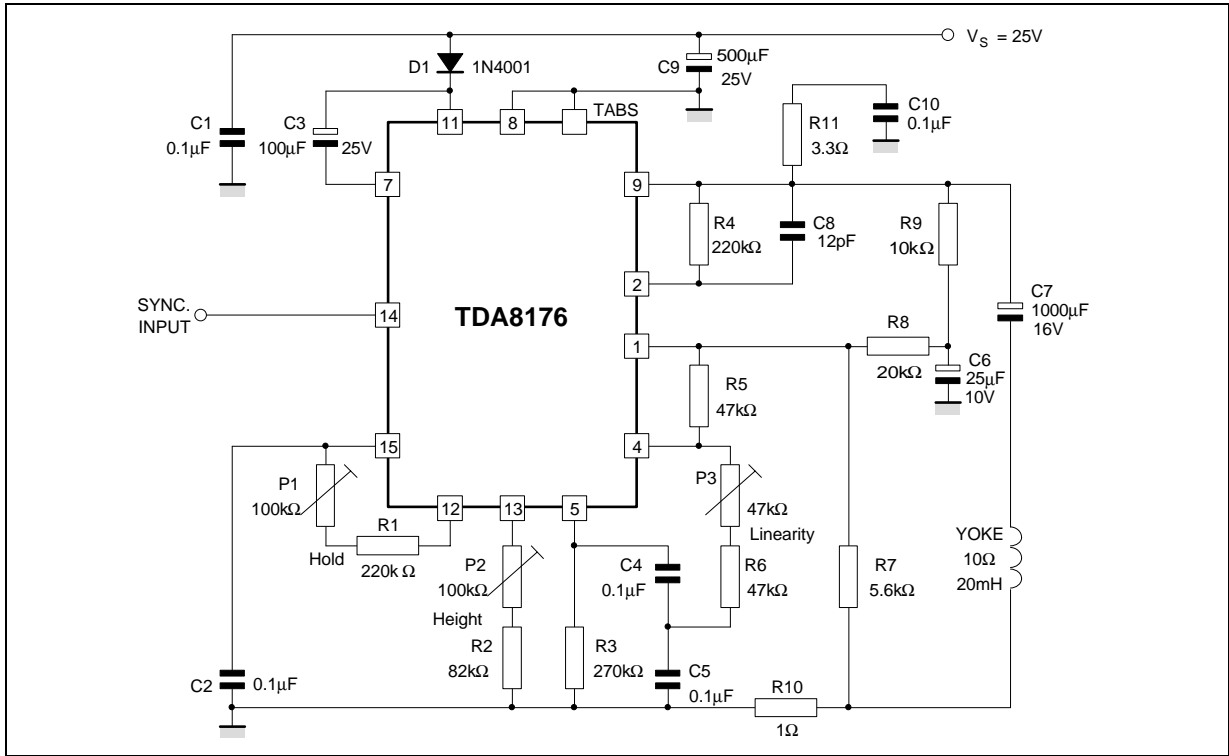
8176-04.TBL

**TYPICAL PERFORMANCE OF THE CIRCUIT OF FIG.1**

Symbol	Parameter	Value	Unit
$V_S$	Operating Supply Voltage	25	V
$I_S$	Supply Current	175	mA
$t_{fy}$	Flyback Time	1	ms
$P_{tot}$	Power Dissipation	3.25	W
$i_y$	Maximum Scanning Current (peak-to-peak)	1.4	A

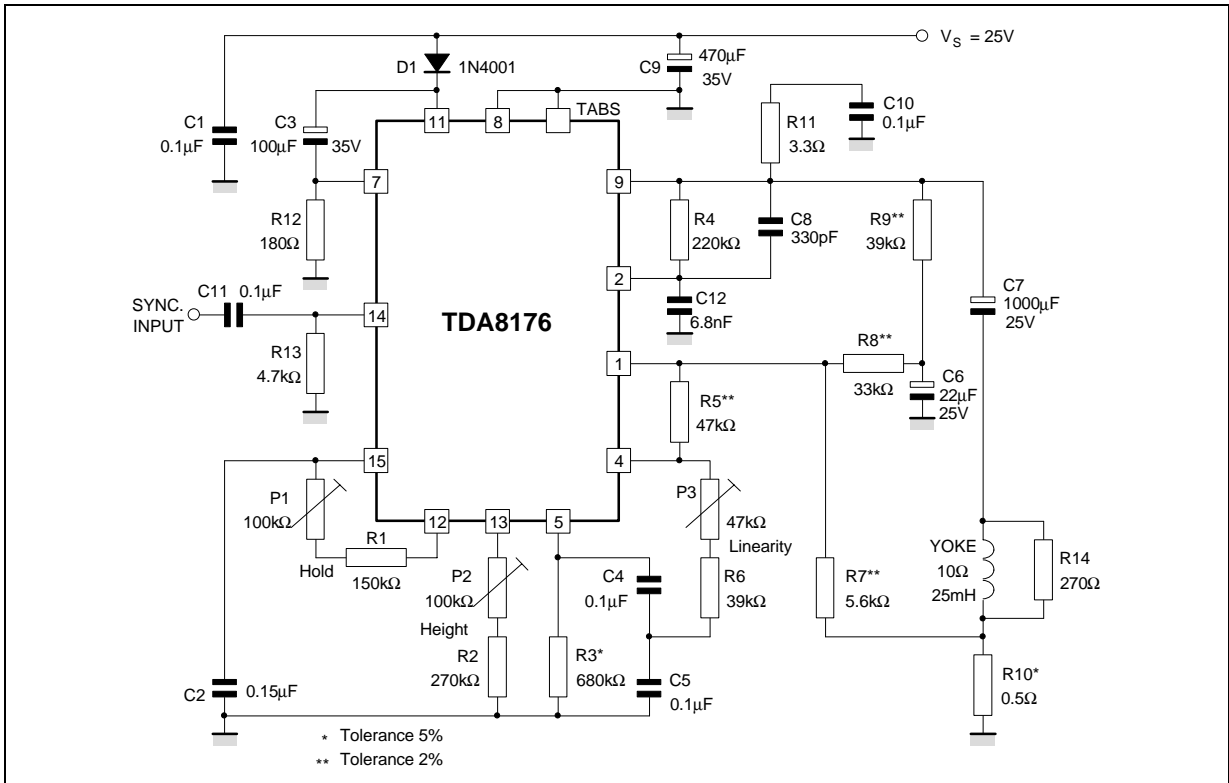
8176-05.TBL

AC TEST CIRCUITS



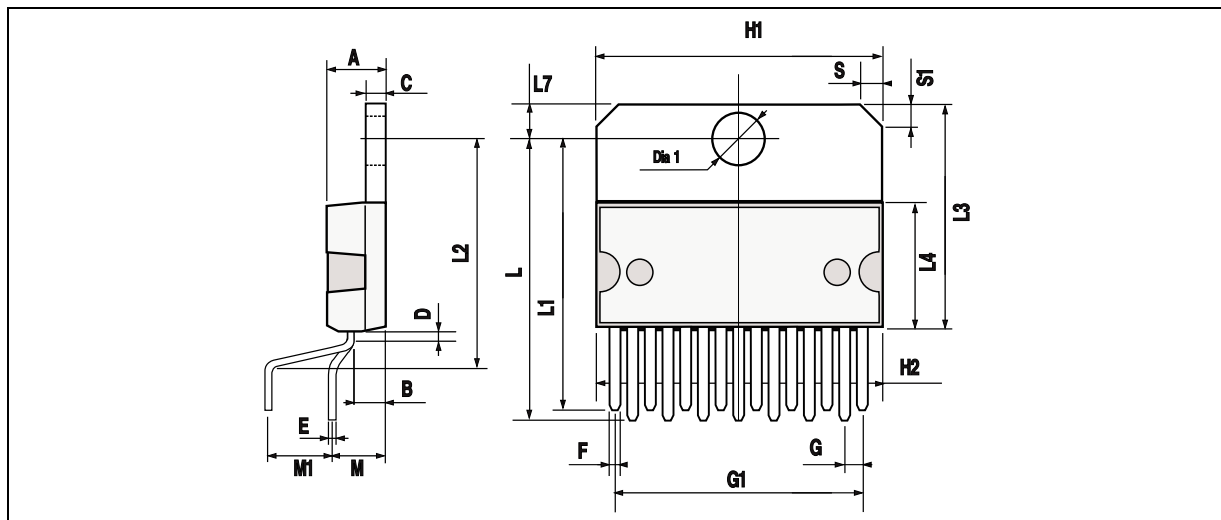
8176-03.EPS

Figure 1 : Typical Application Circuit for large Screen 110° PIL TVC Set ( $R_y = 10 \Omega$  ;  $L_y = 25 \text{ mH}$  ;  $I_y = 1.25 \text{ App}$ ).



8176-04.EPS

## PACKAGE MECHANICAL DATA : 15 PINS - PLASTIC MULTIWATT



PMMULT15V/EP5

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			5			0.197
B			2.65			0.104
C			1.6			0.063
D		1			0.039	
E	0.49		0.55	0.019		0.022
F	0.66		0.75	0.026		0.030
G	1.14	1.27	1.4	0.045	0.050	0.055
G1	17.57	17.78	17.91	0.692	0.700	0.705
H1	19.6			0.772		
H2			20.2			0.795
L	22.1		22.6	0.870		0.890
L1	22		22.5	0.866		0.886
L2	17.65		18.1	0.695		0.713
L3	17.25	17.5	17.75	0.679	0.689	0.699
L4	10.3	10.7	10.9	0.406	0.421	0.429
L7	2.65		2.9	0.104		0.114
M	4.2	4.3	4.6	0.165	0.169	0.181
M1	4.5	5.08	5.3	0.177	0.200	0.209
S	1.9		2.6	0.075		0.102
S1	1.9		2.6	0.075		0.102
Dia. 1	3.65		3.85	0.144		0.152

MUL15V/TBL

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