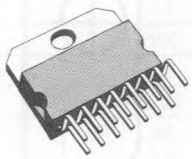
SGS-THOMSON MICROELECTRONICS

TDA8176

TV VERTICAL DEFLECTION SYSTEM FOR TV AND MONITORS

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



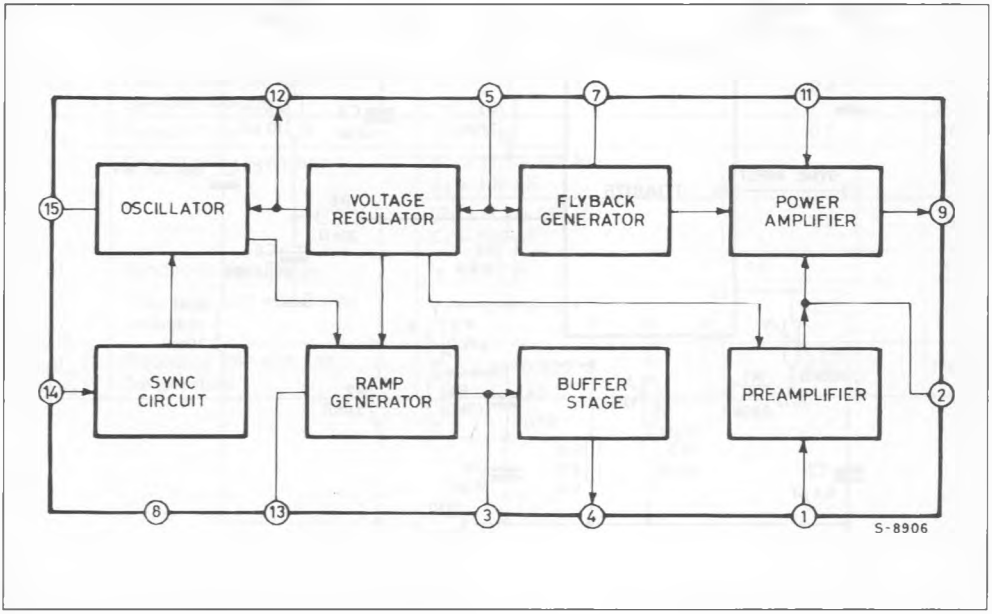
MULTIWATT 15

ORDER CODE : TDA8176

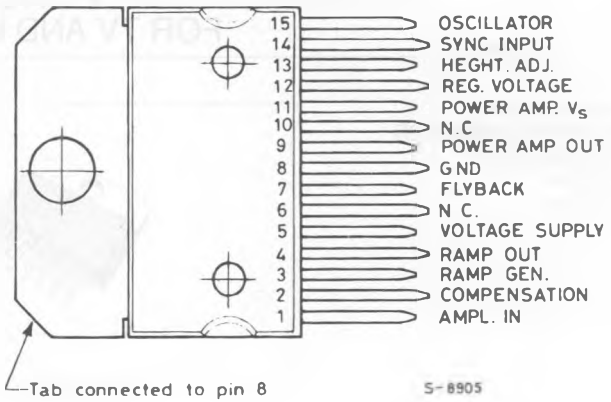
DESCRIPTION

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

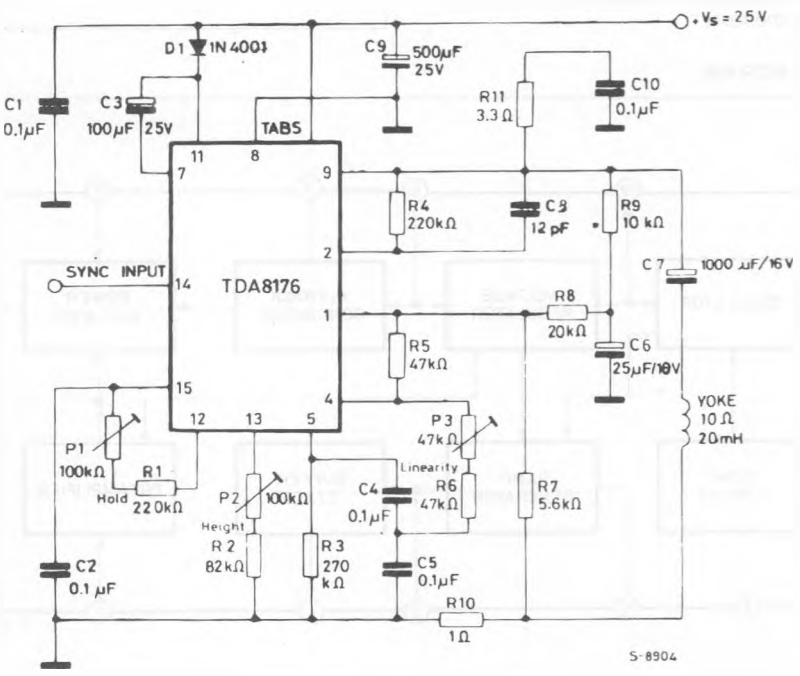
BLOCK DIAGRAM



CONNECTION DIAGRAM



AC TEST CIRCUITS



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_5	Supply Voltage at Pin 2	35	V
V_4, V_5	Flyback Peak Voltage	60	V
V_{10}	Power Amplifier Input Voltage	+ 10 − 0.5	V V
I_o	Output Peak Current (non repetitive) at t = 2 ms	2	A
I_o	Output Peak Current at f = 50 Hz t ≤ 10 µs	2.5	A
I_o	Output Peak Current at f = 50 Hz t > 10 µs	1.5	A
I_3	Pin 3 DC Current at $V_4 < V_2$	100	mA
I_3	Pin 3 Peak to Peak Flyback Current for f = 50 Hz, $t_{fly} \leq 1.5$ ms	1.8	A
I_8	Pin 8 Current	± 20	mA
P_{tot}	Power Dissipation : at T_{tab} = 90 °C at T_{amb} = 80 °C	20 1.4	W W
T_{stg}, T_j	Storage and Junction Temperature	− 40 to 150	°C

THERMAL DATA

$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	3	°C/W
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max	50	°C/W

AC CHARACTERISTICS

(refer to the test circuit, V_s = 25 V ; f = 50 Hz ; T_{amb} = 25 °C, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_s	Supply Current	I_y = 1 App		140		mA
I_{14}	Sync. Input Current (positive or negative)		500			µA
V_9	Flyback Voltage	I_y = 1 App		51		V
V_{15}	Peak to peak Oscillator Sawtooth Voltage			2.4		V
t_{fly}	Flyback Time	I_y = 1 App		0.7		ms
f_o	Free Running Frequency	$(P_1 + R_1)$ = 300 KΩ C_2 = 100 nF		44		Hz
		$(P_1 + R_1)$ = 260 KΩ C_2 = 100 nF		52		Hz
Δf	Synchronization Range	I_8 = 0.5 mA	14			Hz
$\frac{\Delta f}{\Delta V_s}$	Frequency Drift with Supply Voltage	V_s = 10 to 35 V		0.005		Hz/V
$\left\lvert\frac{\Delta f}{\Delta T_{tab}}\right\rvert$	Frequency Drift with Tab Temperature	T_{tab} = 40 to 120 °C		0.01		Hz/°C

ELECTRICAL CHARACTERISTICS

DC CHARACTERISTICS (V_s = 35 V, T_{amb} = 25 °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	µA
$-I_1$	Amplifier Input Bias Current	$V_1 = 1$ V		0.1	10	µA
$-I_3$	Ramp Generator Bias Current	$V_3 = 0$		0.02	0.3	µA
$-I_3$	Ramp Generator Current	$I_{13} = 20$ µA $V_3 = 0$	18.5	20	21.5	µA
$\frac{\Delta I_3}{I_3}$	Ramp Generator Non-linearity	$\Delta V_{12} = 0$ to 12 V $I_{13} = 20$ µA		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 $R_1 = 10$ kΩ $R_2 = 10$ kΩ	4.1	4.4	4.75	V
		$V_s = 35$ V $R_1 = 30$ kΩ $R_2 = 10$ kΩ	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	$I_{13} = 10$ µA	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			MΩ

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_{fly}	Flyback Time	1	ms
P_{tot}	TDA8176 Power Dissipation	3.25	W
I_y	Maximum Scanning Current (peak to peak)	1.4	A

Figure 1 : Typical Application Circuit for large Screen 110° PIL TVC Set (Ry = 10 Ω ; Ly = 25 mH ; Iy = 1.25 App).