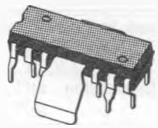
SGS-THOMSON
MICROELECTRONICS

TDA1170N

LOW-NOISE TV VERTICAL DEFLECTION SYSTEM

- COMPLETE VERTICAL DEFLECTION SYSTEM
- LOW NOISE
- SUITABLE FOR HIGH DEFINITION MONITORS

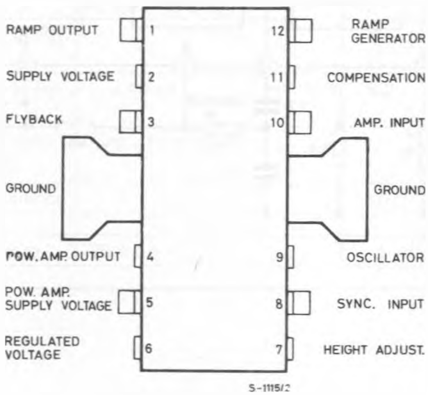


ORDER CODE : TDA 1170N

DESCRIPTION

The TDA 1170N is a monolithic integrated circuit in a 12-lead quad in-line plastic package. It is intended for use in black and white and colour TV receivers. Low-noise makes this device particularly suitable for use in monitors. The functions incorporated are : synchronization circuit, oscillator and ramp generator, high power gain amplifier, flyback generator, voltage regulator.

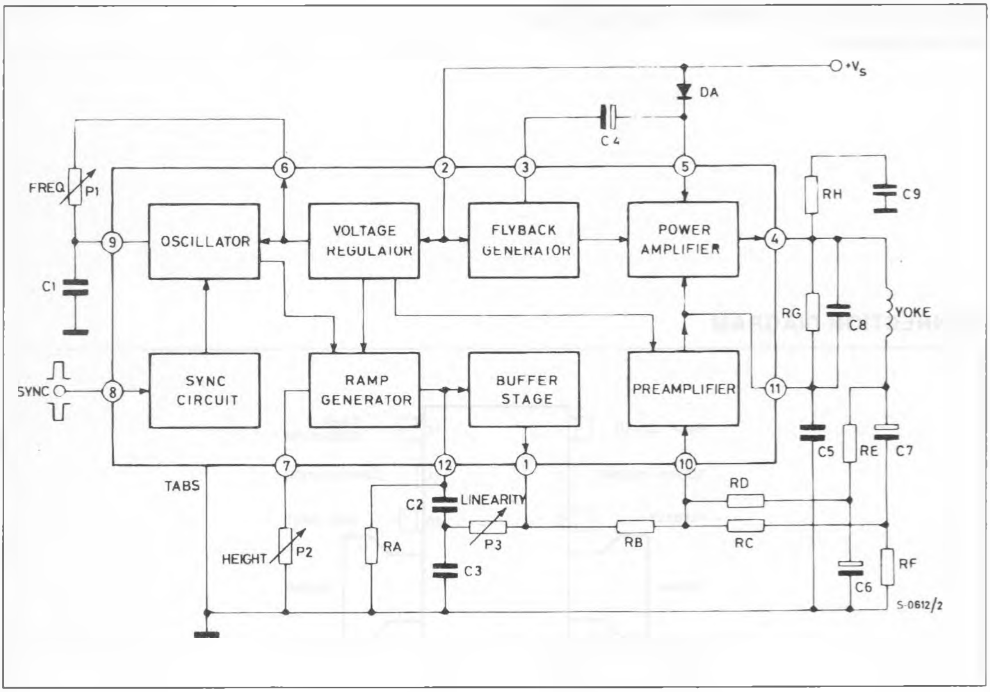
CONNECTION DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_s	Supply Voltage at Pin 2	35	V
V4, V5	Flyback Peak Voltage	60	V
V10	Power Amplifier Input Voltage	{ + 10 – 0.5	V V
I_o	Output Peak Current (non repetitive) at t = 2 msec	2	A
I_o	output Peak Current at f = 50 Hz t ≤ 10 µsec	2.5	A
I_o	Output Peak Current at f = 50 Hz t > 10 µsec	1.5	A
I_3	pin 3 DC Current at V4 < V2	100	mA
I_3	Pin 3 Peak to Peak Flyback Current for f = 50 Hz, t_{fly} ≤ 1.5 msec	1.8	A
I_8	Pin 8 Current	± 20	mA
P_{tot}	Power Dissipation : at T_{ab} = 90 °C at T_{amb} = 80 °C (free air)	5 1	W W
T_{stg}, T_j	Storage and Junction Temperature	– 40 to 150	°C

BLOCK DIAGRAM



THERMAL DATA

$R_{th\ j\text{-}tab}$	Thermal Resistance Junction-tab	Max	12	°C/W
$R_{th\ j\text{-}amb}$	Thermal Resistance Junction-ambient	Max	70	°C/W(°)

(°) Obtained with tabs soldered to printed circuit wth minimized copper area.

ELECTRICAL CHARACTERISTICS (Refer to the test circuits, V_S = 35 V, Tamb = 25 °C, unless otherwise specified)

DC CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit	Fig.
I_2	Pin 2 Quiescent Current	$I_3 = 0$		7	14	mA	1b
I_5	Pin 5 Quiescent Current	$I_4 = 0$		8	17	mA	1b
$-I_9$	Oscillator Bias Current	V9 = 1 V		0.1	1	µA	1a
$-I_{10}$	Amplifier Input Bias Current	V10 = 1 V		1	10	µA	1b
$-I_{12}$	Ramp Generator Bias Current	V12 = 0		0.02	0.3	µA	1a
$-I_{12}$	Ramp Generator Current	I_7 = 20 µA V12 = 0	18.5	20	21.5	µA	1b
$\frac{\Delta I_{12}}{I_{12}}$	Ramp Generator Non-linearity	ΔV12 = 0 to 12 V I_7 = 20 µA		0.2	1	%	1b
V_s	Supply Voltage Range		10		35	V	
V1	Pin 1 Saturation Voltage to Ground	I_1 = 1 mA		1	1.4	V	
V3	Pin 3 Saturation Voltage to Ground	I_3 = 10 mA		300	450	mV	1a
V4	Qiuescent output Voltage	V_s = 10 V R1 = 1 kΩ R2 = 1 kΩ	4.1	4.4	4.75	V	1a
		V_s = 35 V R1 = 3 kΩ R2 = 1 kΩ	8.3	8.8	9.45	V	1a
V4L	Output Saturation Voltage to Ground	$-I_4$ = 0.1 A		0.9	1.2	V	1c
		$-I_4$ = 0.8 A		1.9	2.3	V	1c
V4H	Output Saturation Voltage to Supply	I_4 = 0.1 A		1.4	2.1	V	1d
		I_4 = 0.8 A		2.8	3.2	V	1d
V6	Regulated Voltage at Pin 6		6.1	6.5	6.9	V	1b
V7	Regulated Voltage at Pin 7	I_7 = 20 µA	6.2	6.6	7	V	1b
$\left\|\frac{\Delta V6}{\Delta V_s}\right\|$; $\frac{\Delta V7}{\Delta V_s}$	Regulated Voltage Drift with Supply Voltage	ΔVs = 10 to 35 V		1		mV/V	1b
V10	Amplifier Input Reference Voltage		2.07	2.2	2.3	V	
R8	pin 8 Input Resistance	V8 ≤ 0.4 V	1			MΩ	1a

Figure 1 : DC Test Circuits.

Figure 1a.

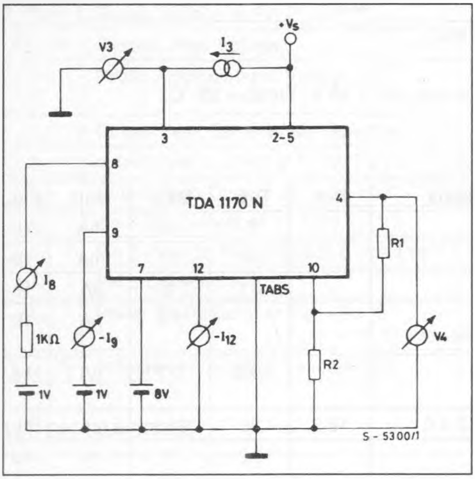


Figure 1b.

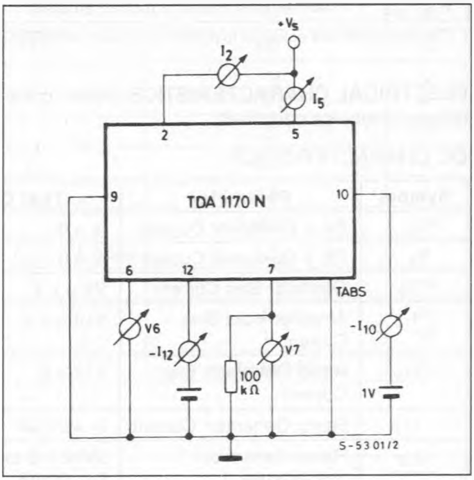


Figure 1c.

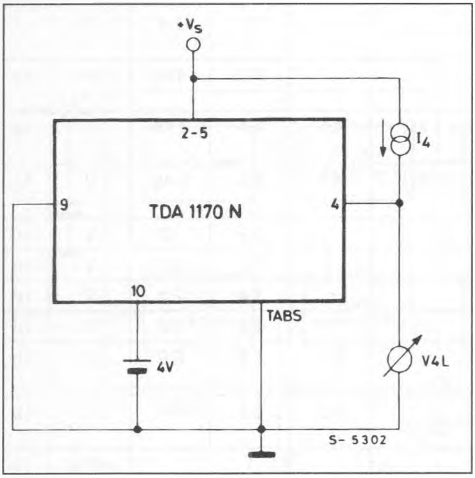
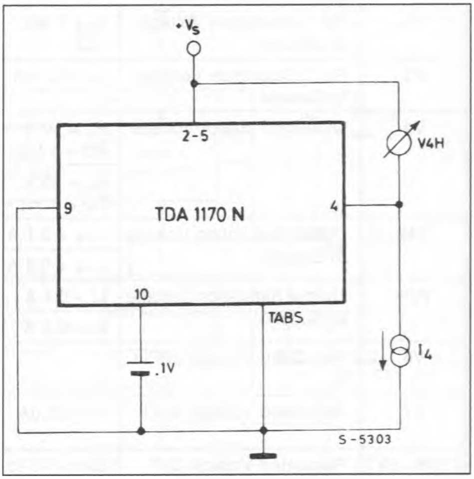


Figure 1d.



ELECTRICAL CHARACTERISTICS (Refer to the AC test circuit, V_s = 22 V ; F = 50 Hz ; T_{amb} = 25 °C, unless otherwise specified)

AC CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_s	Supply Current	I_y = 1 App		140		mA
I_8	Sync. Input Current (positive or negative)		500			µA
V4	Flyback Voltage	I_y = 1 App		45		V
t_{fly}	Flyback Time	I_y = 1 App		0.7		ms
V_{ON}	Peak to Peak Output Noise	pin 9 Connected to GND			40	mVpp
f_o	Free Running Frequency	(P1 + R1) = 300 kΩ C2 = 0.1 µF		42.2		Hz
		(P1 + R1) = 260 kΩ C2 = 0.1 µF		48.5		Hz
Δf	Sychronization 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
$\frac{\lvert \Delta f \rvert}{\Delta T_{ab}}$	Frequency Drift with tab Temperature	T_{tab} = 40 to 120 °C		0.01		Hz/°C

Figure 2 : AC Test and Application Circuit for Large Screen B/W TV Set 10 Ω/20 mH/1 App.

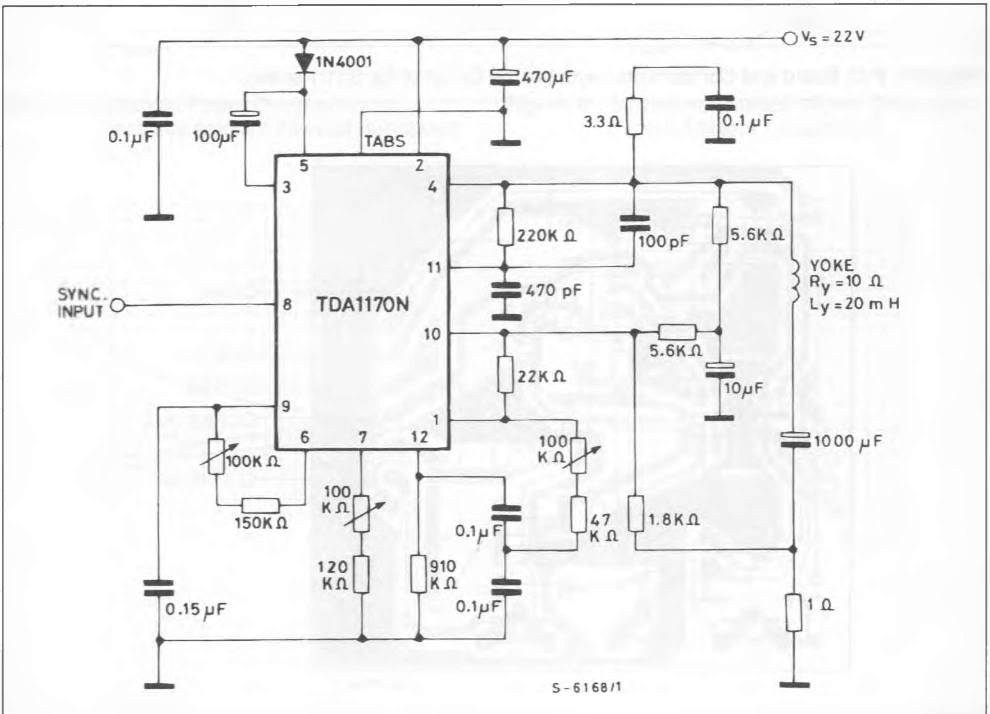


Figure 3 : Typical Application Circuit for Small Screen 90 ° TVC Set (R_Y = 15 Ω, L_Y = 30 mH, I_Y = 0.82 App).

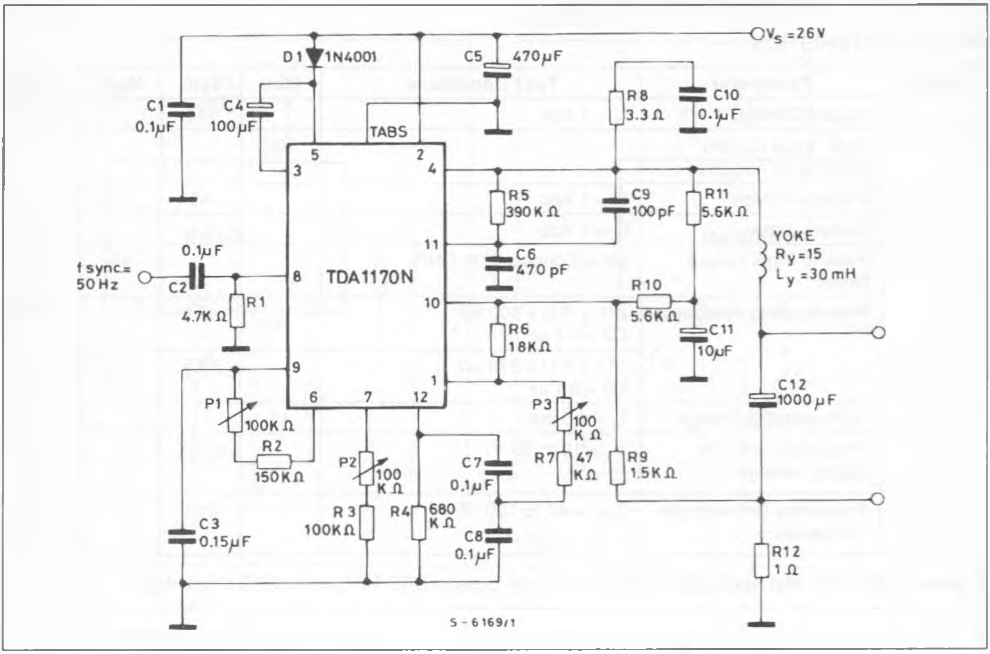
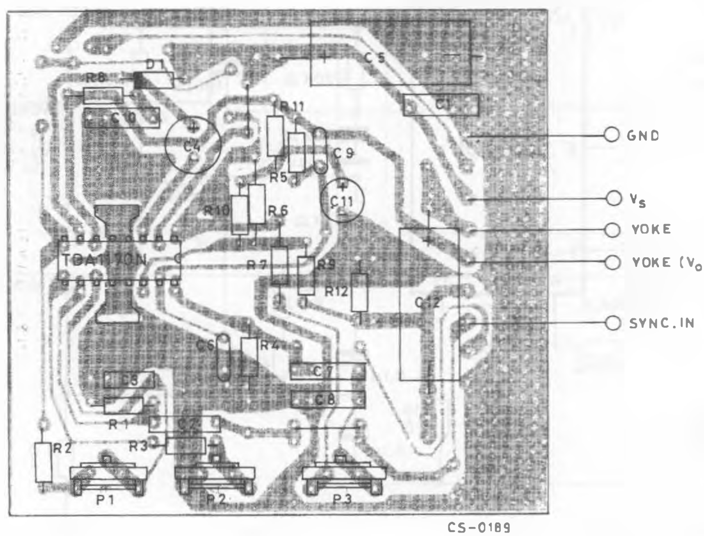


Figure 4 : P.C. Board and Components Layout of the Circuit of fig. 3 (1:1 scale).



MOUNTING INSTRUCTION

During soldering the tab temperature must not exceed 260°C and the soldering time must not be longer than 12 seconds.

The external heatsink or printed circuit copper area must be connected to electrical ground.

The junction to ambient thermal resistance can be reduced by soldering the tabs to a suitable copper area of the printed circuit board (fig. 5) or to an external heatsink (fig. 6).

The diagram of fig. 7 shows the maximum dissipable power P_{tot} and the $R_{th\ j\text{-}amb}$ as a function of the side "e" of two equal square copper areas having a thicknessof 35 μ (1.4 mil).

Figure 5 : Exmple of P.C. Board Copper Area Used as Heatsink.

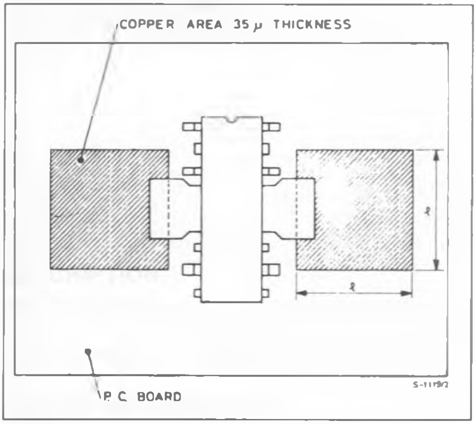


Figure 6 : Example of External heatsink.

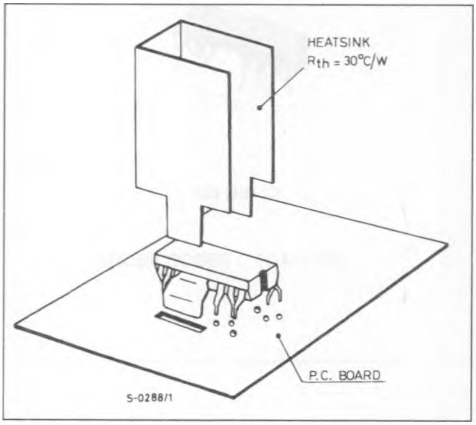


Figure 7 : Maximum Power Dissipation and Junctional Ambient Thermal Resistance vs. "e".

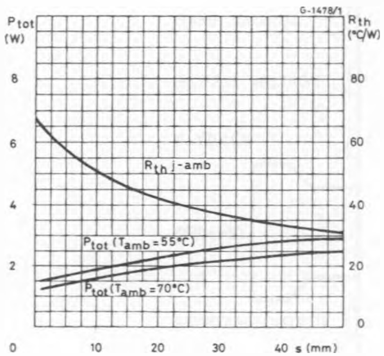


Figure 8 : Maximum Allowable Power Dissipation Versus Ambient Temperature.