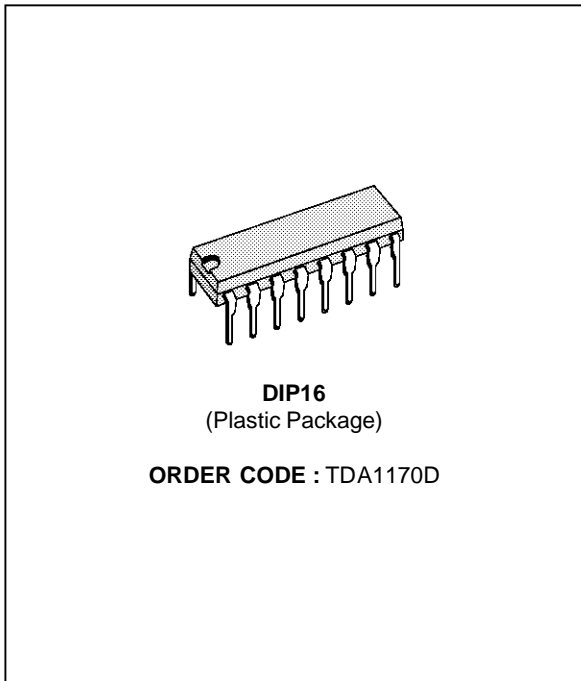


**LOW-NOISE TV VERTICAL DEFLECTION SYSTEM**

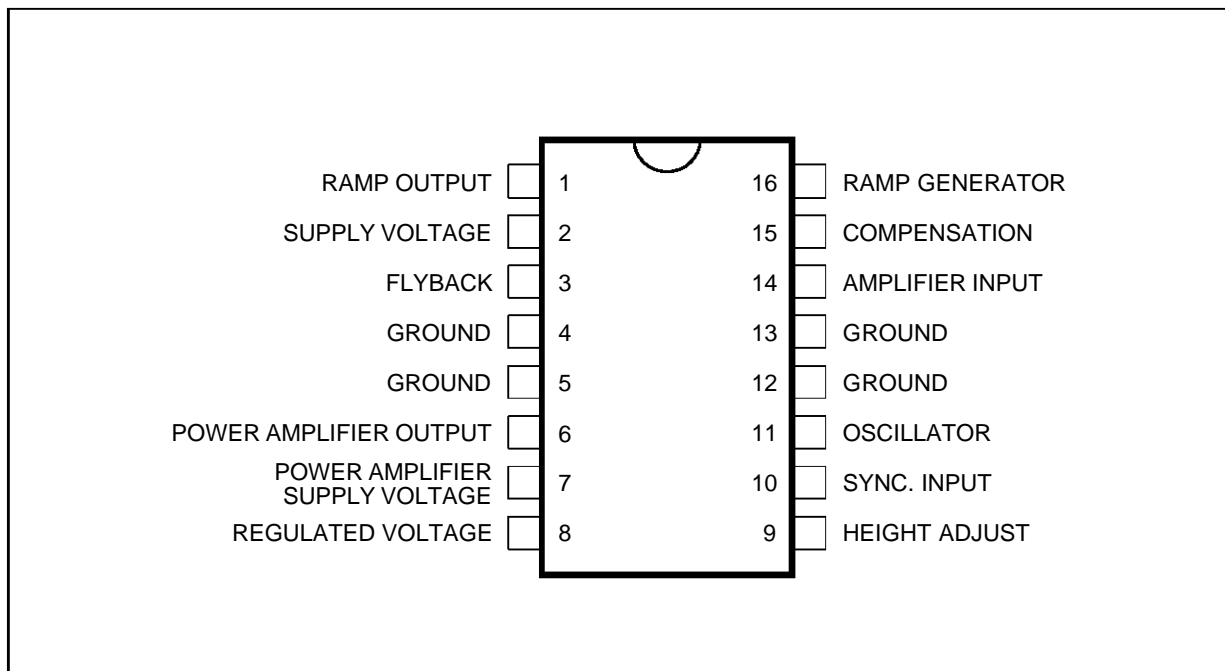
- COMPLETE VERTICAL DEFLECTION SYSTEM
- LOW NOISE
- SUITABLE FOR HIGH DEFINITION MONITORS



**DESCRIPTION**

The TDA 1170D is a monolithic integrated circuit in a 16-lead dual 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.

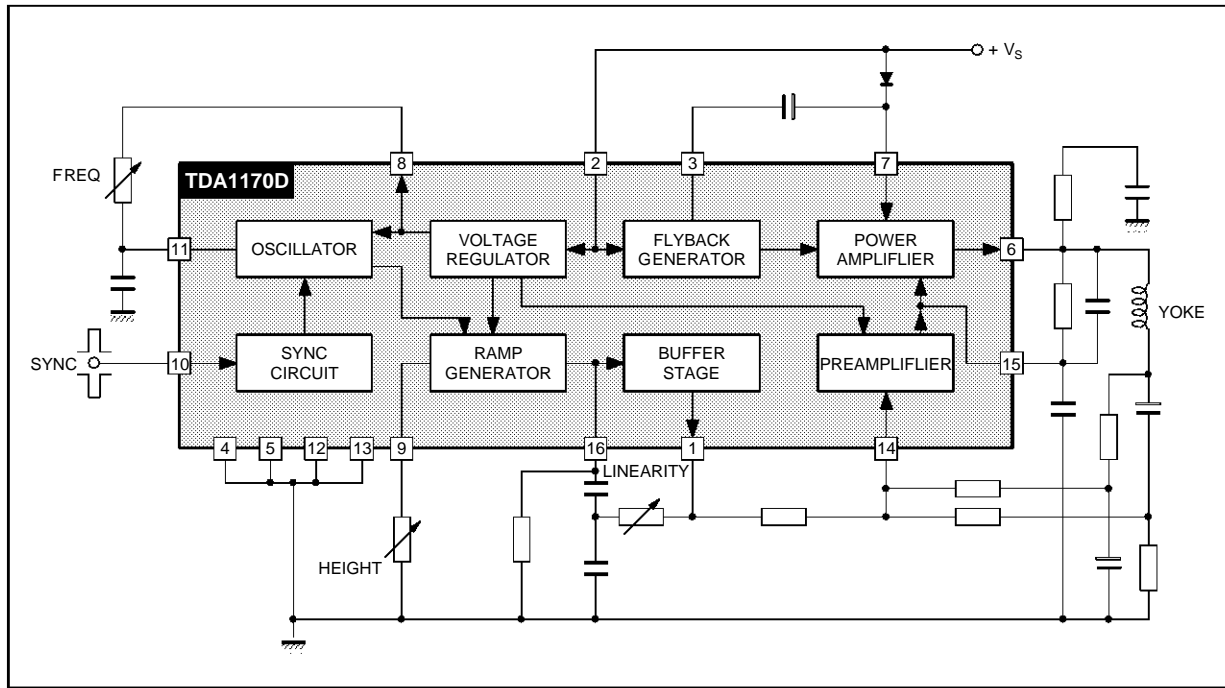
**PIN CONNECTIONS**



1170D-01.EPS

# TDA1170D

## BLOCK DIAGRAM



1170D-02.EPS

## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_s$	Supply Voltage at Pin 2	35	V
$V_6, V_7$	Flyback Peak Voltage	60	V
$V_{14}$	Power Amplifier Input Voltage	+ 10 - 0.5	V V
$I_o$	Output Peak Current (non repetitive) at $t = 2\text{msec}$	2	A
$I_o$	Output Peak Current at $f = 50\text{Hz}$ $t \leq 10\mu\text{sec}$	2.5	A
$I_o$	Output Peak Current at $f = 50\text{Hz}$ $t > 10\mu\text{sec}$	1.5	A
$I_3$	Pin 3 DC Current at $V_6 < V_2$	100	mA
$I_3$	Pin 3 Peak to Peak Flyback Current for $f = 50\text{Hz}$ , $t_{fly} \leq 1.5\text{msec}$	1.8	A
$I_{10}$	Pin 10 Current	$\pm 20$	mA
$P_{tot}$	Power Dissipation : at $T_{tab} = 90^\circ\text{C}$ at $T_{amb} = 70^\circ\text{C}$ (free air)	4.3 1	W W
$T_{stg}, T_j$	Storage and Junction Temperature	- 40 to 150	$^\circ\text{C}$

1170D-01.TBL

## THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{th\ j-case}$	Thermal Resistance Junction-pins	Max 14	$^\circ\text{C/W}$
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max 80	$^\circ\text{C/W}^*$

\* Obtained with pins 4, 5, 12, 13 soldered to printed circuit with minimized copper area.

1170D-02.TBL

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

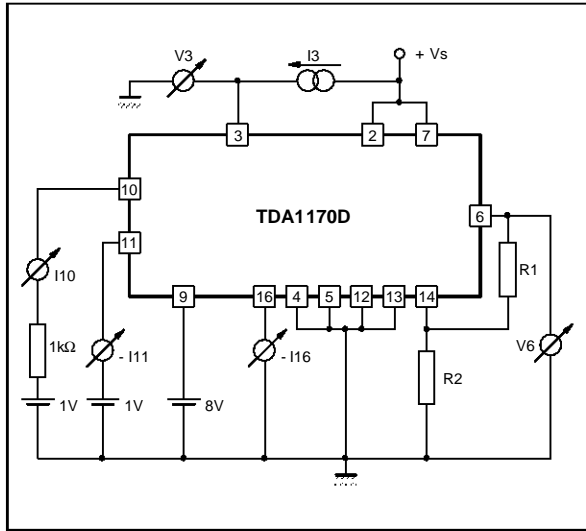
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit	Fig.
$I_2$	Pin 2 Quiescent Current	$I_3 = 0$		7	14	mA	1b
$I_7$	Pin 7 Quiescent Current	$I_6 = 0$		8	17	mA	1b
$-I_{11}$	Oscillator Bias Current	$V_{11} = 1V$		0.1	1	$\mu A$	1a
$-I_{14}$	Amplifier Input Bias Current	$V_{14} = 1V$		1	10	$\mu A$	1b
$-I_{16}$	Ramp Generator Bias Current	$V_{16} = 0$		0.02	0.3	$\mu A$	1a
$-I_{16}$	Ramp Generator Current	$I_9 = 20\mu A$ , $V_{16} = 0$	18.5	20	21.5	$\mu A$	1b
$\frac{\Delta I_{16}}{I_{16}}$	Ramp Generator Non-linearity	$\Delta V_{16} = 0$ to $12V$ , $I_9 = 20\mu A$		0.2	1	%	1b
$V_S$	Supply Voltage Range		10		35	V	–
$V_1$	Pin 1 Saturation Voltage to Ground	$I_1 = 1mA$		1	1.4	V	–
$V_3$	Pin 3 Saturation Voltage to Ground	$I_3 = 10mA$		300	450	mV	1a
$V_6$	Quiescent Output Voltage	$V_S = 10V$ $R_1 = 1k\Omega$ , $R_2 = 1k\Omega$	4.1	4.4	4.75	V	1a
		$V_S = 35V$ $R_1 = 3k\Omega$ , $R_2 = 1k\Omega$	8.3	8.8	9.45	V	1a
$V_{6L}$	Output Saturation Voltage to Ground	$-I_6 = 0.1A$		0.9	1.2	V	1c
		$-I_6 = 0.8A$		1.9	2.3	V	1c
$V_{6H}$	Output Saturation Voltage to Supply	$I_6 = 0.1A$		1.4	2.1	V	1d
		$I_6 = 0.8A$		2.8	3.2	V	1d
$V_8$	Regulated Voltage at Pin 8		6.1	6.5	6.9	V	1b
$V_9$	Regulated Voltage at Pin 9	$I_9 = 20\mu A$	6.2	6.6	7	V	1b
$\frac{\Delta V_8}{\Delta V_S}$ , $\frac{\Delta V_9}{\Delta V_S}$	Regulated Voltage Drift with Supply Voltage	$\Delta V_S = 10$ to $35V$		1		mV/V	1b
$V_{14}$	Amplifier Input Reference Voltage		2.07	2.2	2.3	V	–
R10	Pin 10 Input Resistance	$V_{10} \leq 0.4V$	1			M $\Omega$	1a

1170D-03.TBL

# TDA1170D

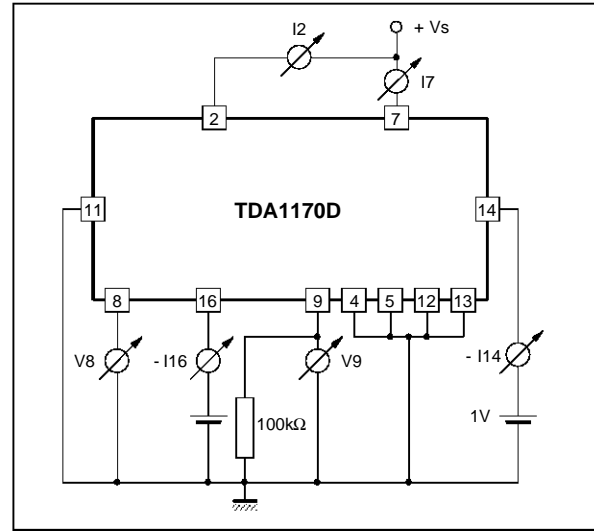
Figure 1 : DC Test Circuit

Figure 1a



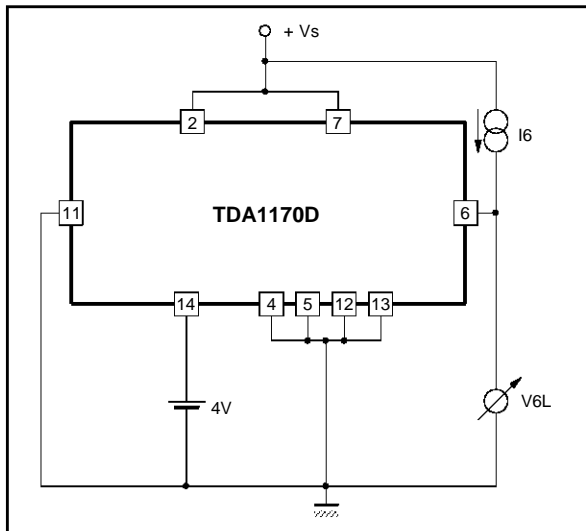
1170D-03.EPS

Figure 1b



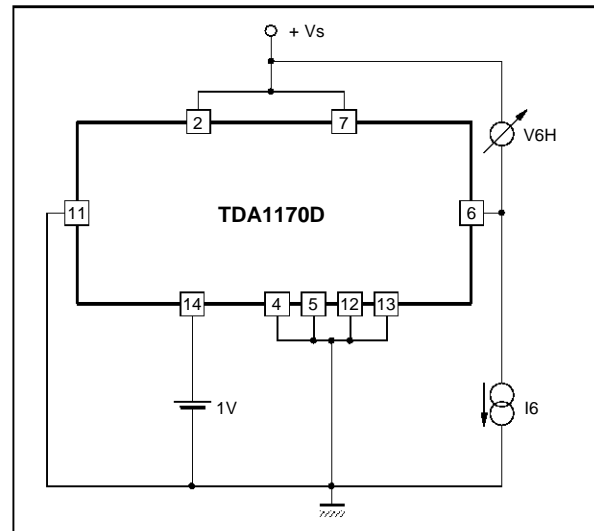
1170D-04.EPS

Figure 1c



1170D-05.EPS

Figure 1d



1170D-06.EPS

## ELECTRICAL CHARACTERISTICS

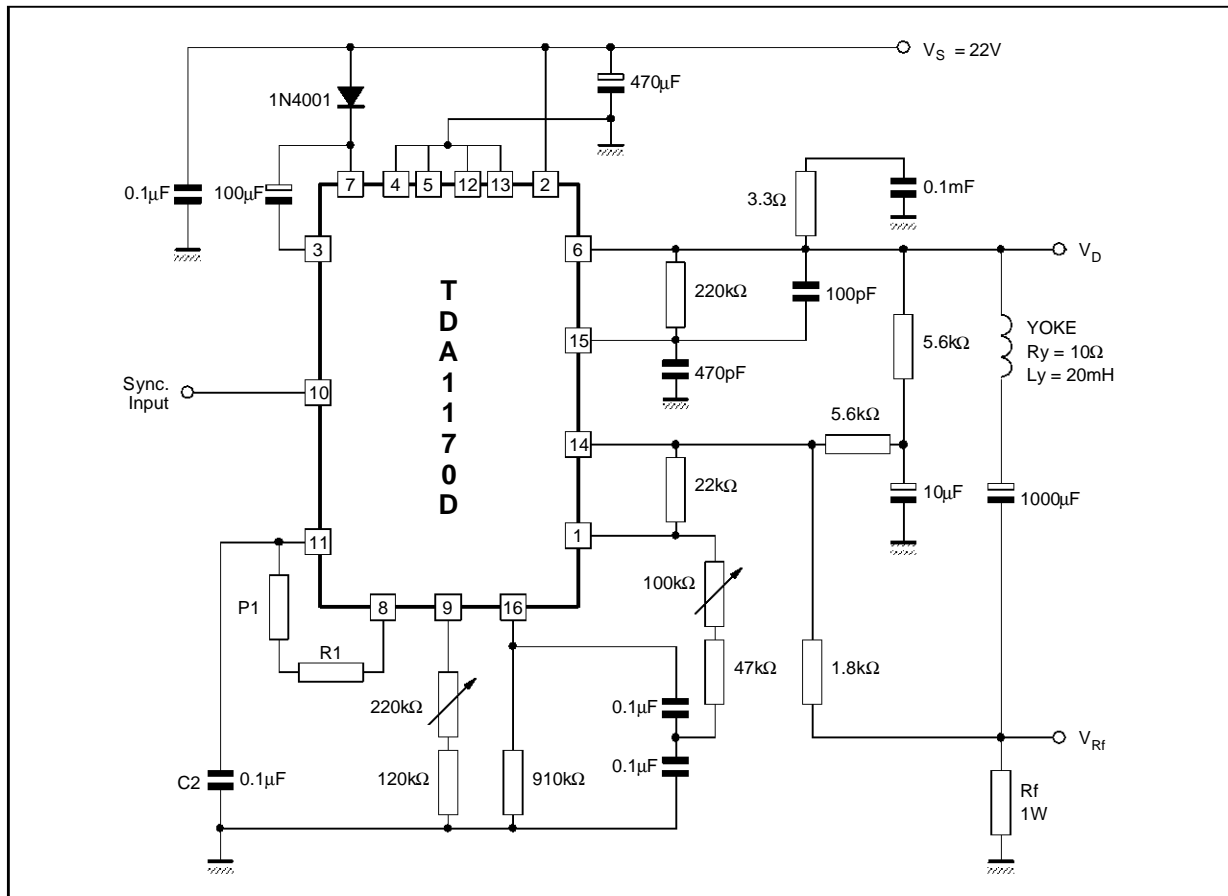
(refer to the AC test circuit,  $V_s = 22V$  ;  $f = 50Hz$  ;  $T_{amb} = 25^\circ C$ , unless otherwise specified)

## AC CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_s$	Supply Current	$I_y = 1A_{pp}$		140		mA
$I_{10}$	Sync. Input Current (positive or negative)		500			$\mu A$
V6	Flyback Voltage	$I_y = 1A_{pp}$		45		V
$t_{fly}$	Flyback Time	$I_y = A_{pp}$		0.7		ms
$V_{ON}$	Peak to Peak Output Noise	Pin 11 Connected to GND			40	mV <sub>PP</sub>
$f_o$	Free Running Frequency	$(P1 = R1) = 260k\Omega$ , $C2 = 0.1\mu F$ $(P1 = R1) = 300k\Omega$ , $C2 = 0.1\mu F$		48.5 42.2		Hz Hz
$\Delta f$	Synchronization Range	$I_b = 0.5mA$	14			Hz
$\frac{\Delta f}{\Delta V_s}$	Frequency Drift with Supply Voltage	$V_s = 10$ to $35V$		0.005		Hz/V
$\frac{\Delta f}{\Delta T_{pins}}$	Frequency Drift vs. Pins 4, 5, 12 and 13 Temp.	$T_{pins} = 40$ to $120^\circ C$		0.01		Hz/ $^\circ C$

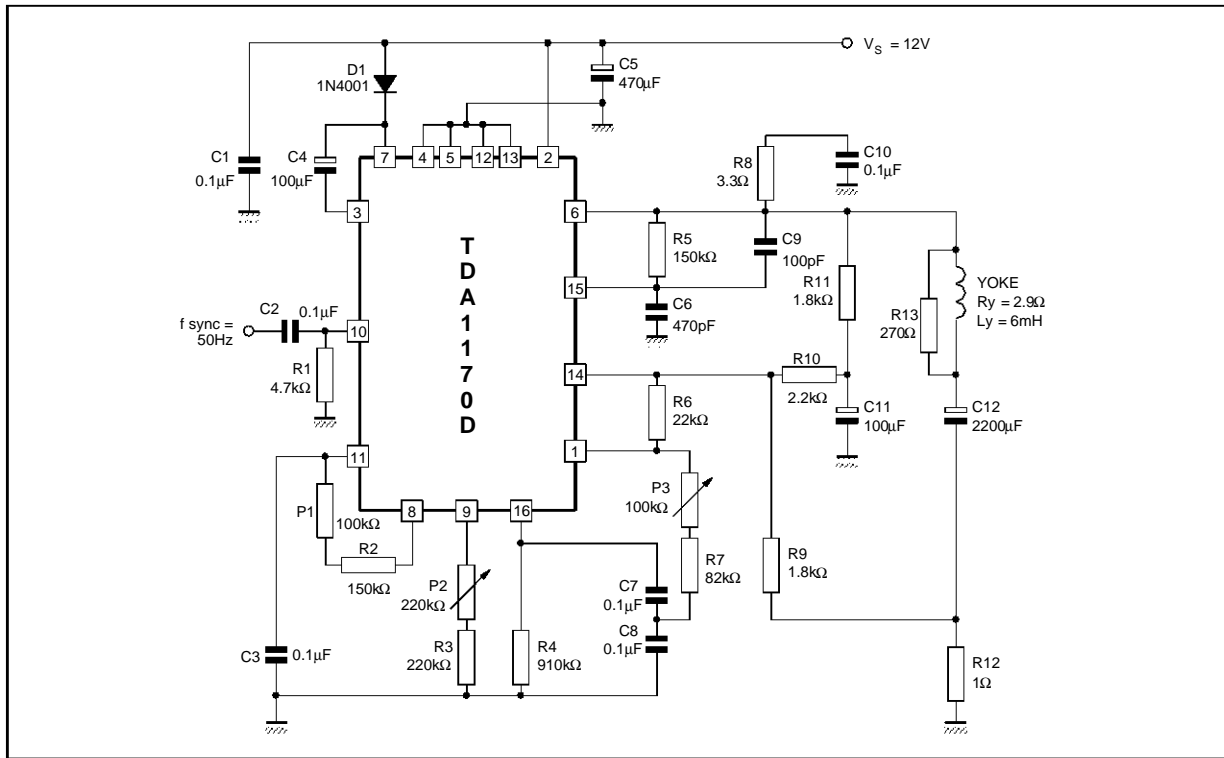
1170D-04.TBL

Figure 2 : AC Test Circuit



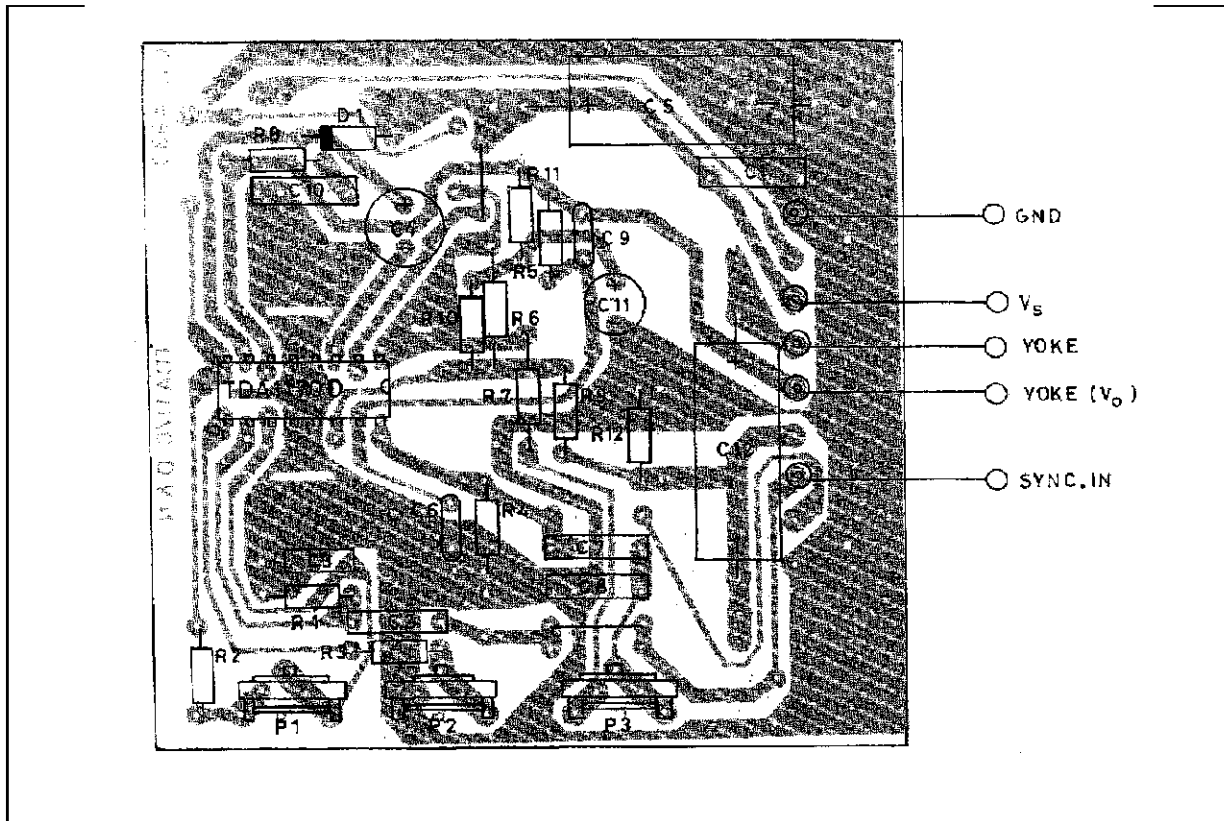
1170D-07.EPS

Figure 3 : Typical Application Circuit for Small Screen B/W TV SET ( $R_y = 2.9\Omega$ ,  $L_y = 6mH$ ,  $I_y = 1.1A$ )



1170D-08.EPS

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



1170D-09.TIF

**MOUNTING INSTRUCTION**

The  $R_{th\ j-amb}$  of the TDA 1170D can be reduced by soldering the GND pins to a suitable copper area of the printed circuit board (fig. 5) or to an external heatsink (fig. 6).

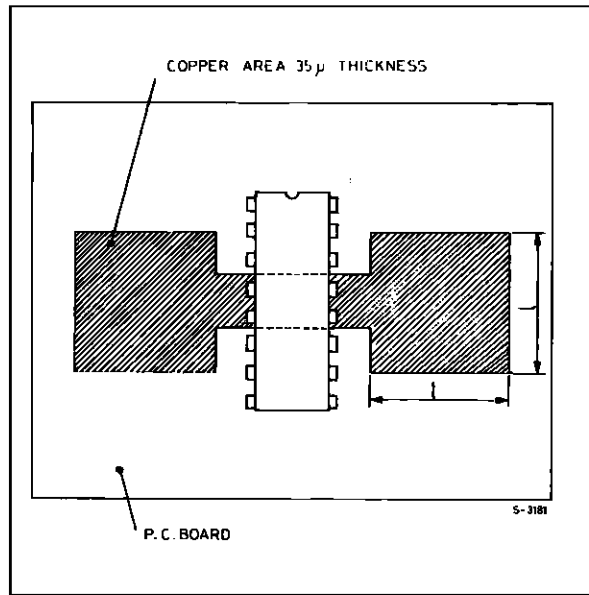
The diagram of figure 7 shows the maximum dissippable power  $P_{tot}$  and the  $R_{th\ j-amb}$  as a function of

the side "l" of two equal square copper areas having a thickness of  $35\ \mu$  (1.4 mils).

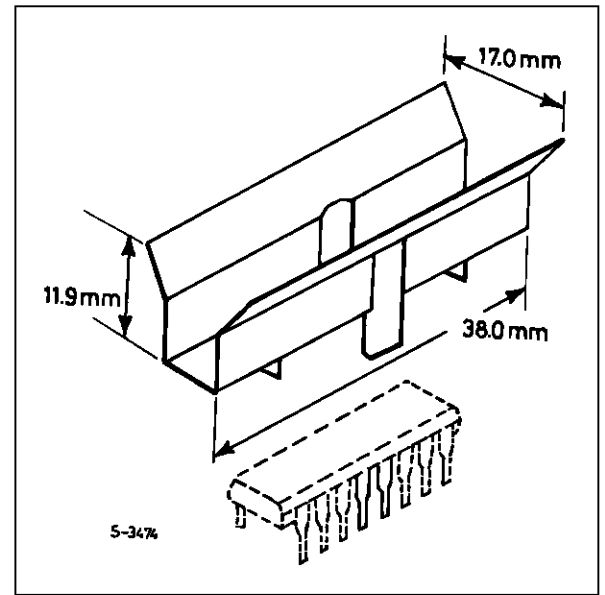
During soldering the pins temperature must not exceed  $260\ ^\circ\text{C}$  and the soldering time must not be longer than 12 seconds.

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

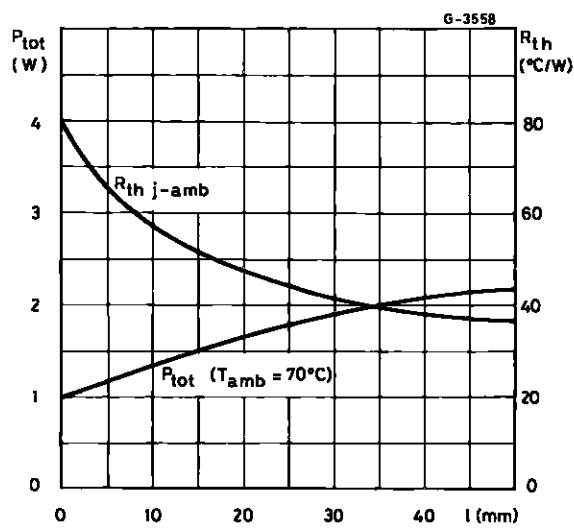
**Figure 5 :** Example of P.C. Board Copper Area which is Used as Heatsink



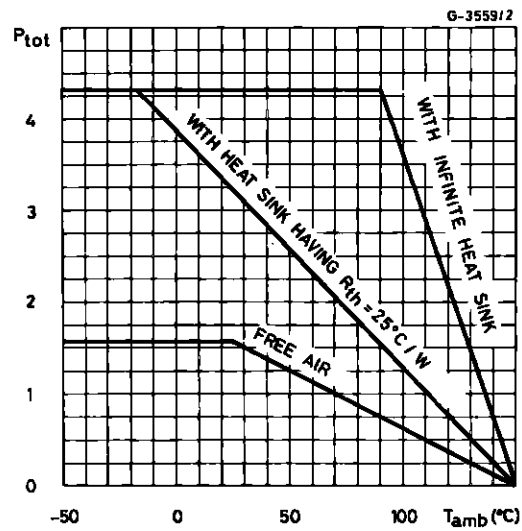
**Figure 6 :** External Heatsink Mounting Example



**Figure 7 :** Maximum Dissippable Power and Junction-Ambient Thermal Resistance versus Side "l"

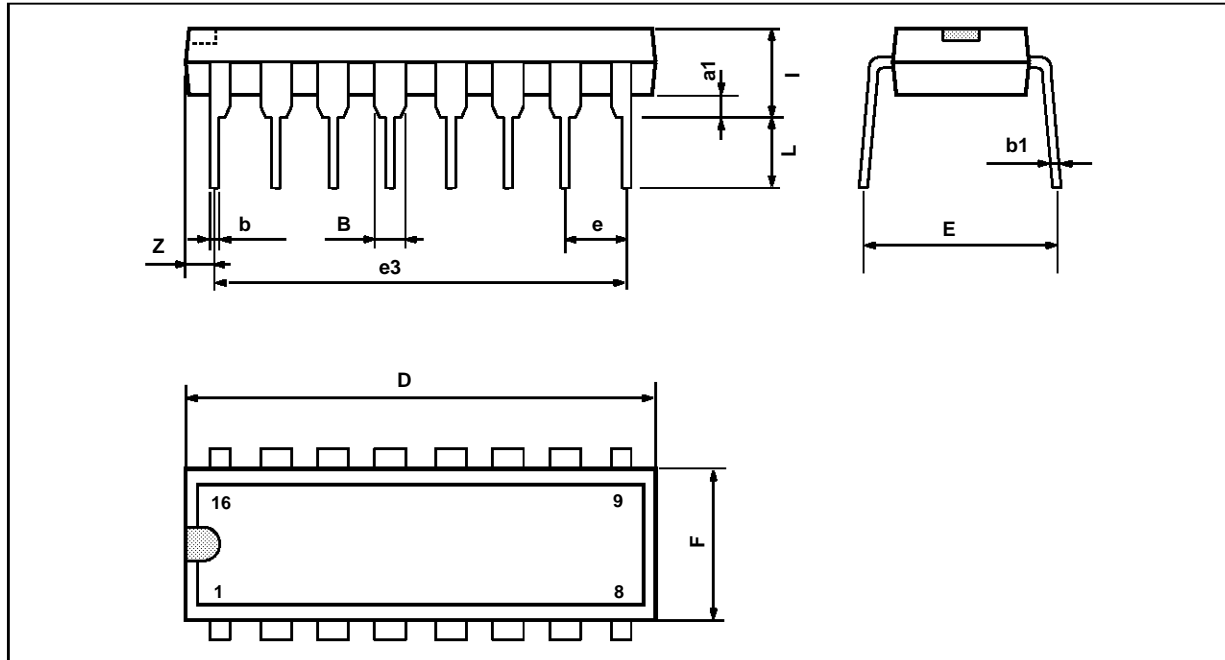


**Figure 8 :** Maximum Allowable Power Dissipation versus Ambient Temperature



# TDA1170D

## PACKAGE MECHANICAL DATA 16 PINS - PLASTIC PACKAGE



PM-DIP16.EPS

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
a1	0.51			0.020		
B	0.77		1.65	0.030		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		17.78			0.700	
F			7.1			0.280
i			5.1			0.201
L		3.3			0.130	
Z			1.27			0.050

DIP16.TBL

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