

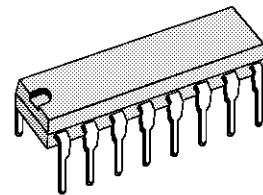
## LOW-NOISE VERTICAL DEFLECTION SYSTEM

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

### DESCRIPTION

The TDA1175P is a monolithic integrated circuit in POWERDIP16 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.

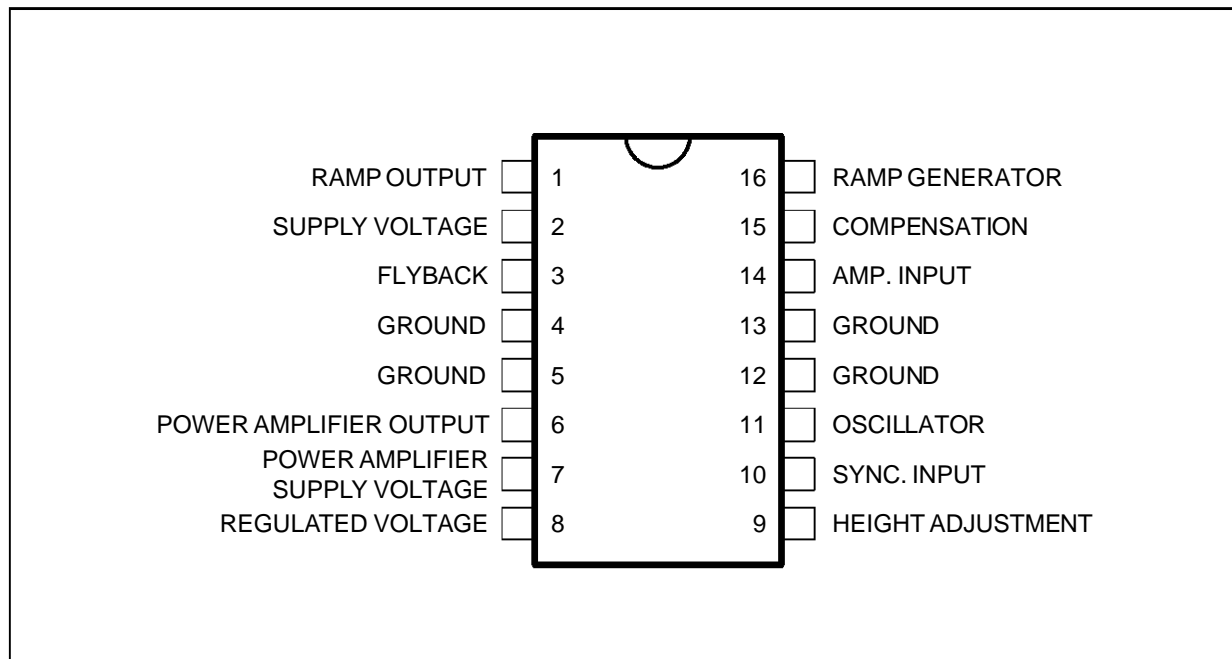
The functions incorporated are : synchronization circuit, oscillator and ramp generator, high power gain amplifier, flyback generator, voltage regulator.



**POWERDIP16**  
(Plastic Package)

**ORDER CODE : TDA1175P**

### PIN CONNECTIONS

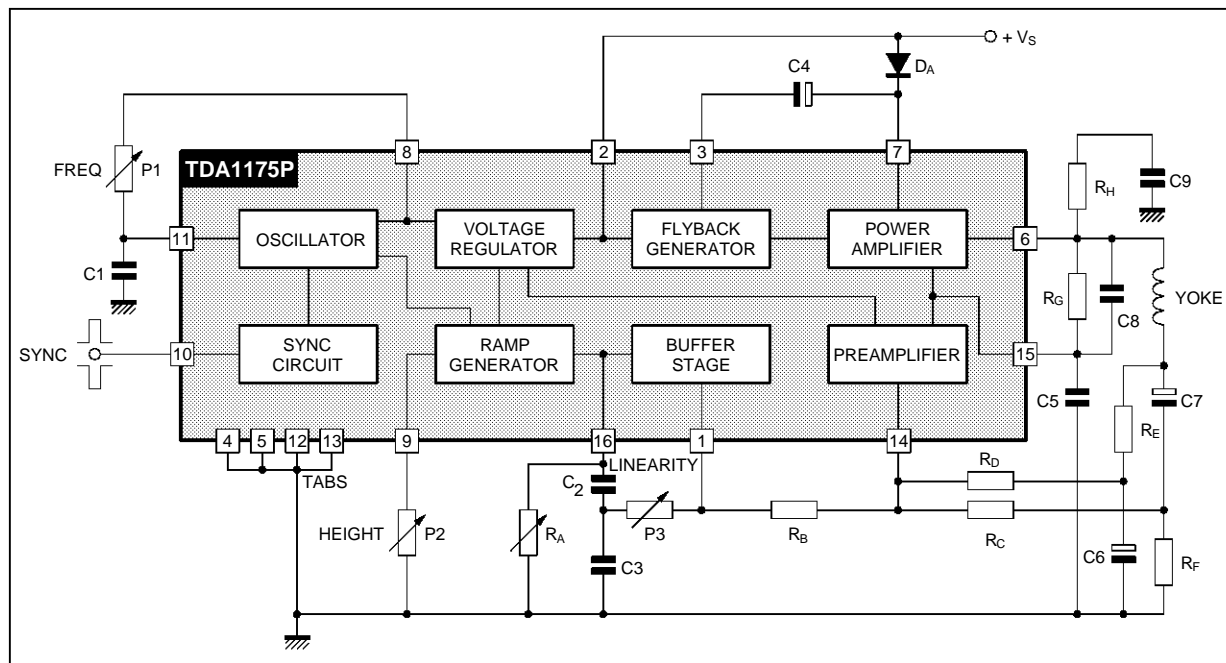


1175P-01 LEPS

# TDA1175P

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## BLOCK DIAGRAM



1175P-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
$I_o$	Output Peak Current (non repetitive) at $t = 2\text{ms}$	2	A
$I_o$	Output Peak Current at $f = 50\text{Hz}, t \leq 10\mu\text{s}$	2.5	A
$I_o$	Output Peak Current at $f = 50\text{Hz}, t > 10\mu\text{s}$	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 $f = 50\text{Hz}, t_{fly} \leq 1.5\text{ms}$	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) (1)	4.3 1	W
$T_{stg}, T_j$	Storage and Junction Temperature	- 40, + 150	$^\circ\text{C}$

1175P-01.TBL

## THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{th(j-tab)}$	Thermal Resistance Junction-pin	Max. 12	$^\circ\text{C/W}$
$R_{th(j-amb)}$	Thermal Resistance Junction-ambient	Max. 80	$^\circ\text{C/W}^{(1)}$

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

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

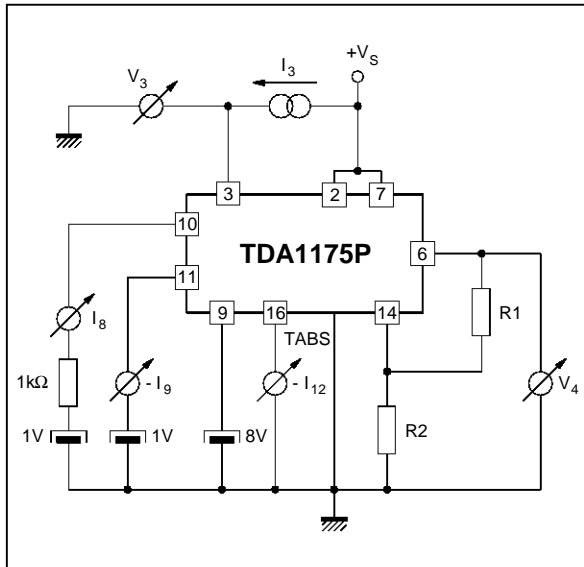
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit	Fig.
DC CHARACTERISTICS (Refer to the test circuits, $V_S = 35\text{V}$ )							
$I_2$	Pin 2 Quiescent Current	$I_3 = 0$		7	14	mA	1b
$I_7$	Pin 7 Quiescent Current	$I_6 = 0$		8	17	mA	1b
$-I_{11}$	Oscillator Bias Current	$V_{11} = 1\text{V}$		0.1	1	$\mu\text{A}$	1a
$-I_{14}$	Amplifier Input Bias Current	$V_{14} = 1\text{V}$		1	10	$\mu\text{A}$	1b
$-I_{16}$	Ramp Generator Bias Current	$V_{16} = 0$		0.02	0.3	$\mu\text{A}$	1a
$-I_{16}$	Ramp Generator Current	$I_9 = 20\mu\text{A}$ , $V_{16} = 0$	18.5	20	21.5	$\mu\text{A}$	1b
$\frac{\Delta I_{16}}{I_{16}}$	Ramp Generator Non-linearity	$\Delta V_{16} = 0$ to $12\text{V}$ , $I_9 = 20\mu\text{A}$		0.2	1	%	1b
$V_S$	Supply Voltage Range		10		35	V	
$V_1$	Pin 1 Saturation Voltage to Ground	$I_1 = 1\text{mA}$		1	1.4	V	
$V_3$	Pin 3 Saturation Voltage to Ground	$I_3 = 10\text{mA}$		1.5	2.5	V	1a
$V_6$	Quiescent output Voltage	$V_S = 10\text{V}$ , $R_1 = 1\text{k}\Omega$ , $R_2 = 1\text{k}\Omega$ $V_S = 35\text{V}$ , $R_1 = 3\text{k}\Omega$ , $R_2 = 1\text{k}\Omega$	4.1 8.2	4.4 8.8	4.7 9.4	V V	1a 1a
$V_{6L}$	Output Saturation Voltage to Ground	$-I_6 = 0.1\text{A}$ $-I_6 = 0.8\text{A}$		0.9 1.8	1.2 2.2	V v	1c 1c
$V_{6H}$	Output Saturation Voltage to Supply	$I_6 = 0.1\text{A}$ $I_6 = 0.8\text{A}$		1.4 2.8	2.1 3.1	V V	1d 1d
$V_8$	Regulated Voltage at Pin 8		6.5	6.7	6.9	V	1b
$V_9$	Regulated Voltage at Pin 9	$I_9 = 20\mu\text{A}$	6.6	6.8	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 $35\text{V}$		1	2	mV/V	1b
$V_{14}$	Amplifier Input Reference Voltage	$V_{10} \leq 0.4\text{V}$	2.20	2.27	2.35	V	

AC CHARACTERISTICS (Refer to the AC test circuit,  $V_S = 22\text{V}$ ,  $f = 50\text{Hz}$ )

$I_S$	Supply Current	$I_Y = 1A_{PP}$		140		mA	2
$I_{10}$	Sync. Input Current (positive or negative)		0.5		2	mA	2
$V_6$	Flyback Voltage	$I_Y = 1A_{PP}$		45		V	2
$t_{fly}$	Flyback Time	$I_Y = 1A_{PP}$		0.7		ms	2
$V_{ON}$	Peak to Peak Output Noise	Pin 11 Connected to GND		18	30	mVpp	2
$f_o$	Free Running Frequency	$(P1 + R1) = 300\text{k}\Omega$ $C9 = 0.1\mu\text{F}$	36	43.5		Hz	2
$f_{OPER}$	Operating Frequency Range		10		120	Hz	2
$\Delta f$	Synchronization Range	$I_{10} = 0.5\text{mA}$ , $C9 = 0.1\mu\text{F}$ $(P1+R1) = 300\text{k}\Omega$	14			Hz	2
$\frac{\Delta f}{\Delta V_S}$	Frequency Drift with Supply Voltage	$V_S = 10$ to $35\text{V}$		0.005		Hz/V	2
$\frac{ \Delta f }{\Delta T_{ab}}$	Frequency Drift with tab Temperature	$T_{tab} = 40$ to $120^{\circ}\text{C}$		0.01		Hz/ $^{\circ}\text{C}$	2

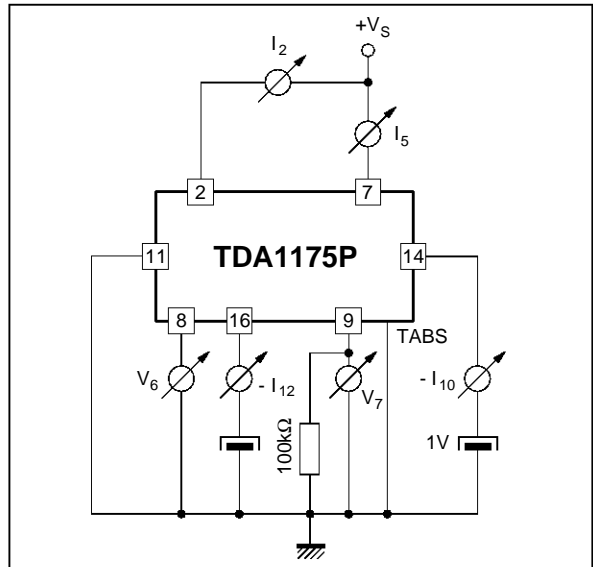
Figure 1 : DC Test Circuits

Figure 1a



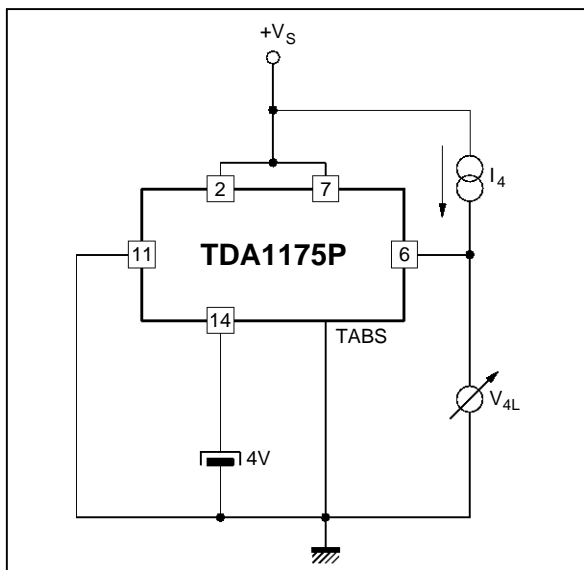
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Figure 1b



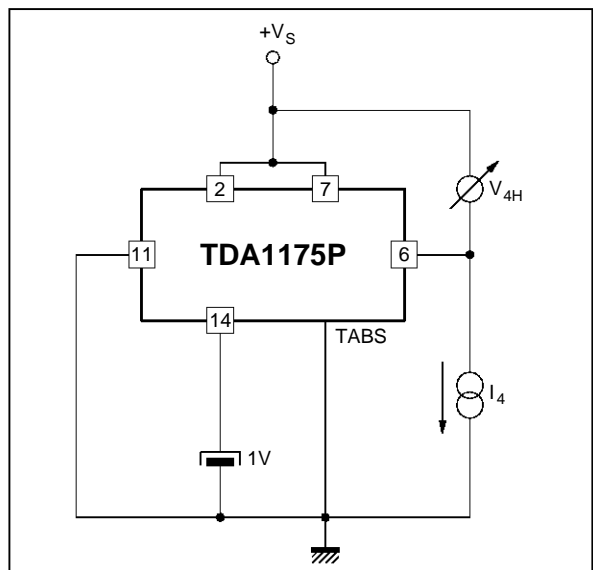
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Figure 1c



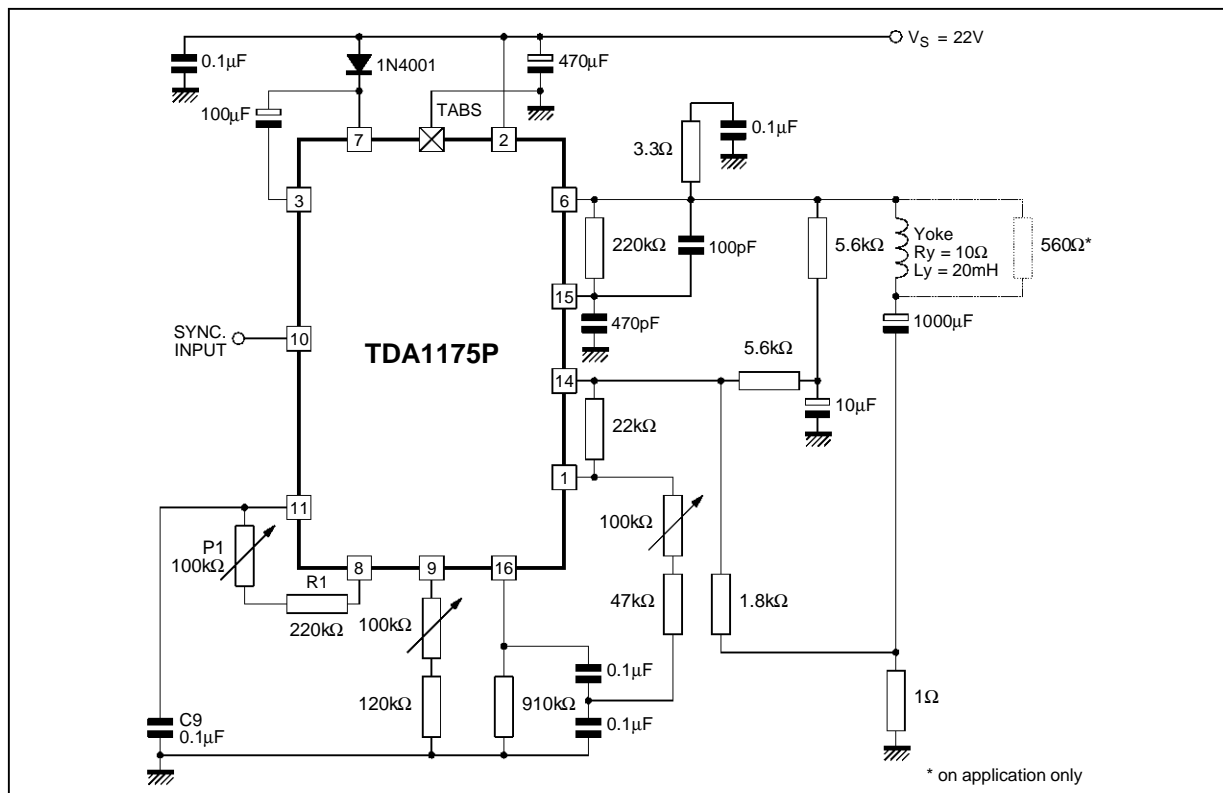
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Figure 1d



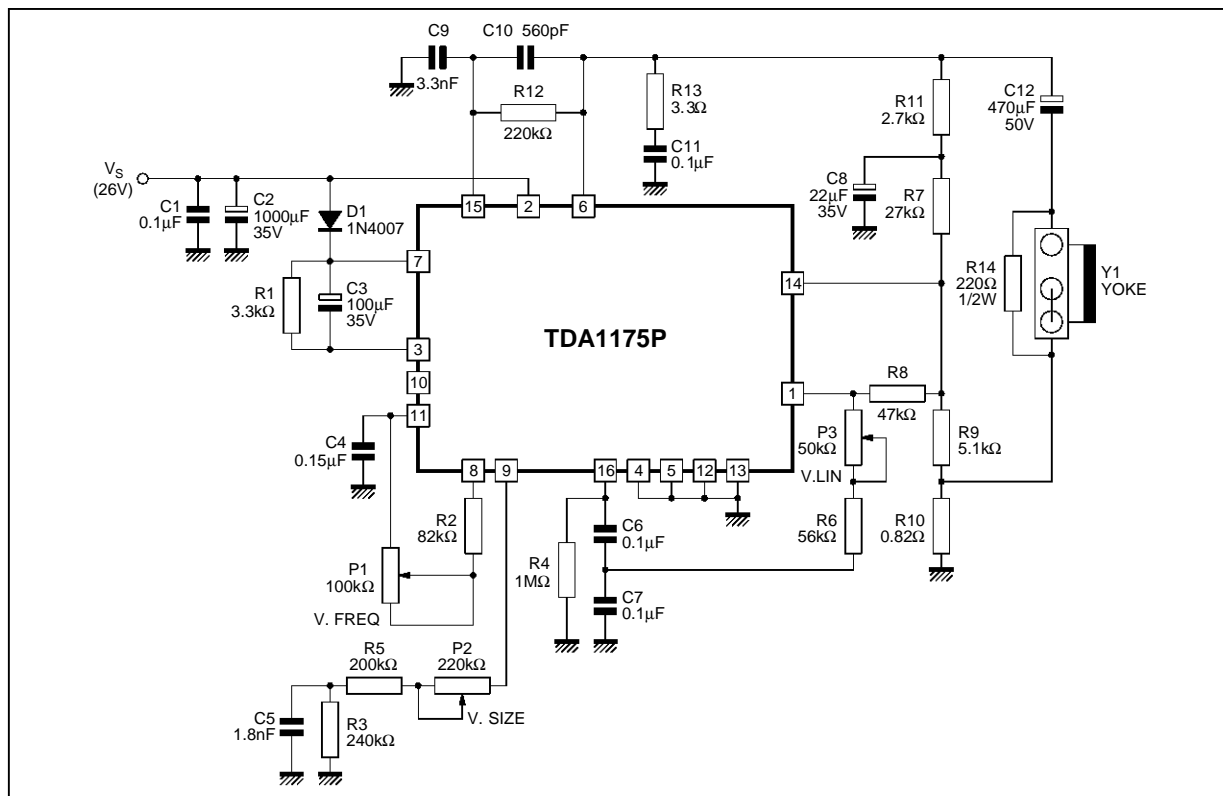
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Figure 2 : AC Test and Application Circuit for Large Screen B/W TV Set 10Ω/20mH/1A<sub>PP</sub>



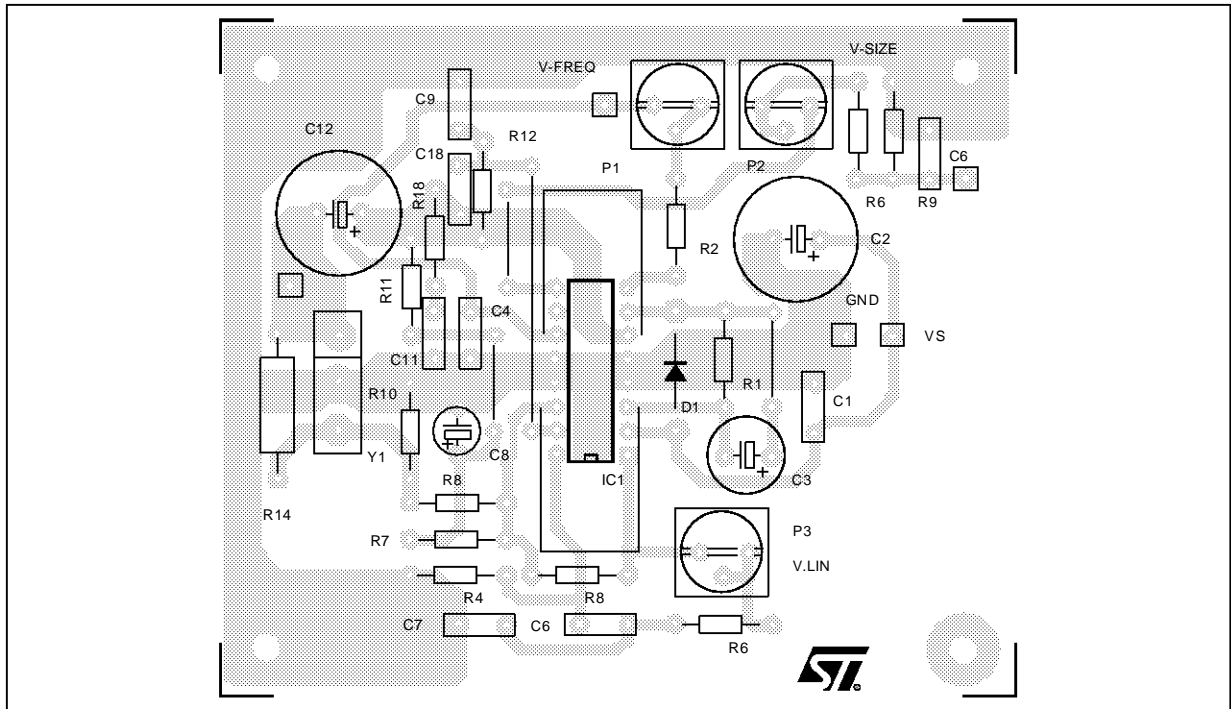
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Figure 3 : Typical Application Circuit for VGA Monitor (R<sub>Y</sub> = 10Ω, L<sub>Y</sub> = 20mH, I<sub>Y</sub> = 0.8A<sub>PP</sub>)



1175P-08.EPS

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



1175P-09.EPS

**BILL OF MATERIAL**

Item	Qty	Reference	Part
1	4	C1, C6, C7, C11	0.1µF
2	1	C2	1000µF 35V
3	1	C3	100µF 35V
4	1	C4	0.15µF
5	1	C5	1.8nF
6	1	C8	22µF 35V
7	1	C9	3.3nF
8	1	C10	560pF
9	1	C12	470µF 50V
10	1	D1	1N4007
11	1	IC1	TDA1175P
12	1	P1	100kΩ POT
13	1	P2	220kΩ POT
14	1	P3	50kΩPOT
15	1	R1	3.3kΩ

Item	Qty	Reference	Part
16	1	R2	82kΩ
17	1	R3	240kΩ
18	1	R4	1MΩ
19	1	R5	200kΩ
20	1	R6	56kΩ
21	1	R7	27kΩ
22	1	R8	47kΩ
23	1	R9	5.1kΩ
24	1	R10	0.82Ω
25	1	R11	2.7kΩ
26	1	R12	220kΩ
27	1	R13	3.3Ω
28	1	R14	220Ω 1/2W
29	1	Y1	YOKE

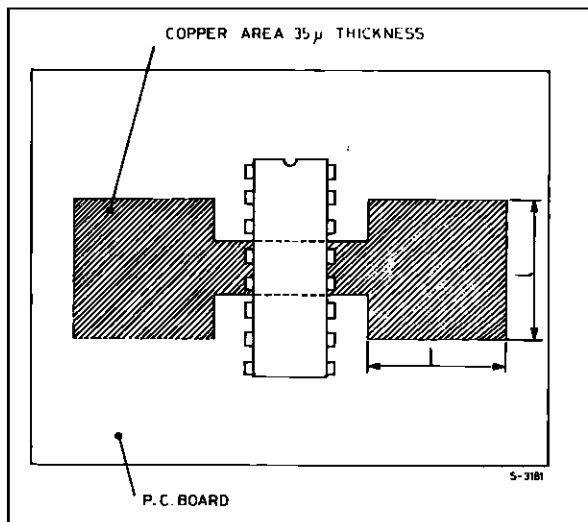
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**MOUNTING INSTRUCTION**

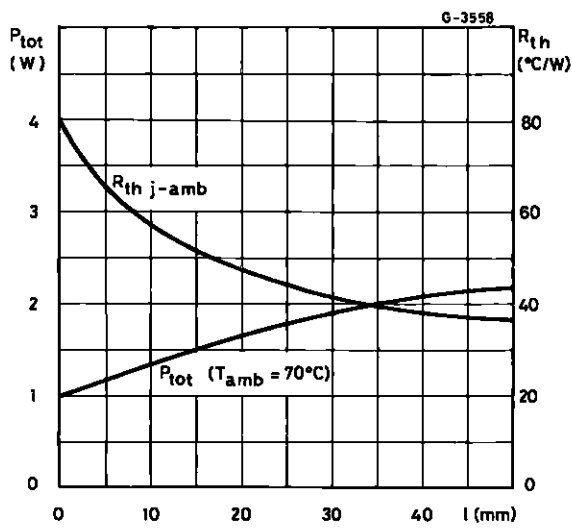
The  $R_{th(j-a)}$  can be reduced by soldering the GND pins to a suitable copper area of the printed circuit board (Figure 5) or to an external heatsink (Figure 6).

The diagram of Figure 7 shows the maximum dissippable power  $P_{tot}$  and the  $R_{th(j-a)}$  as a function of the side "l" of two equal square copper areas

**Figure 5 : Example of P.C. Board Copper Area**



**Figure 7 : Maximum Power Dissipation and Junction-ambient Thermal Resistance versus "l"**

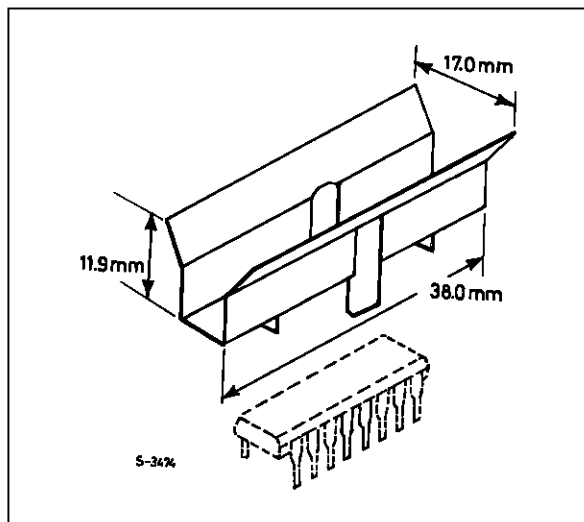


having a thickness of  $35\mu$  (1.4 mils).

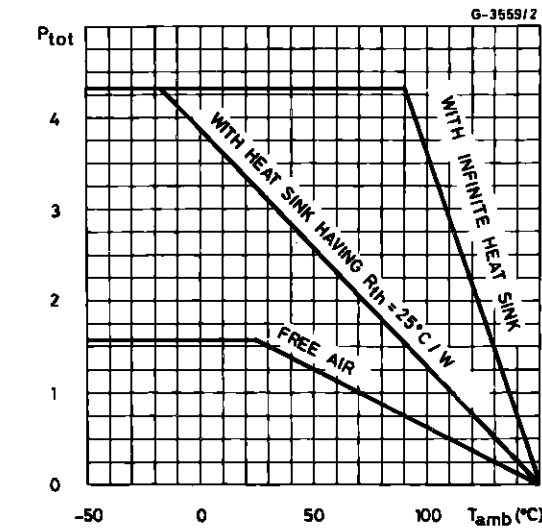
During soldering the pins temperature must not exceed  $260^{\circ}\text{C}$  and the soldering time must not be longer than 12 seconds.

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

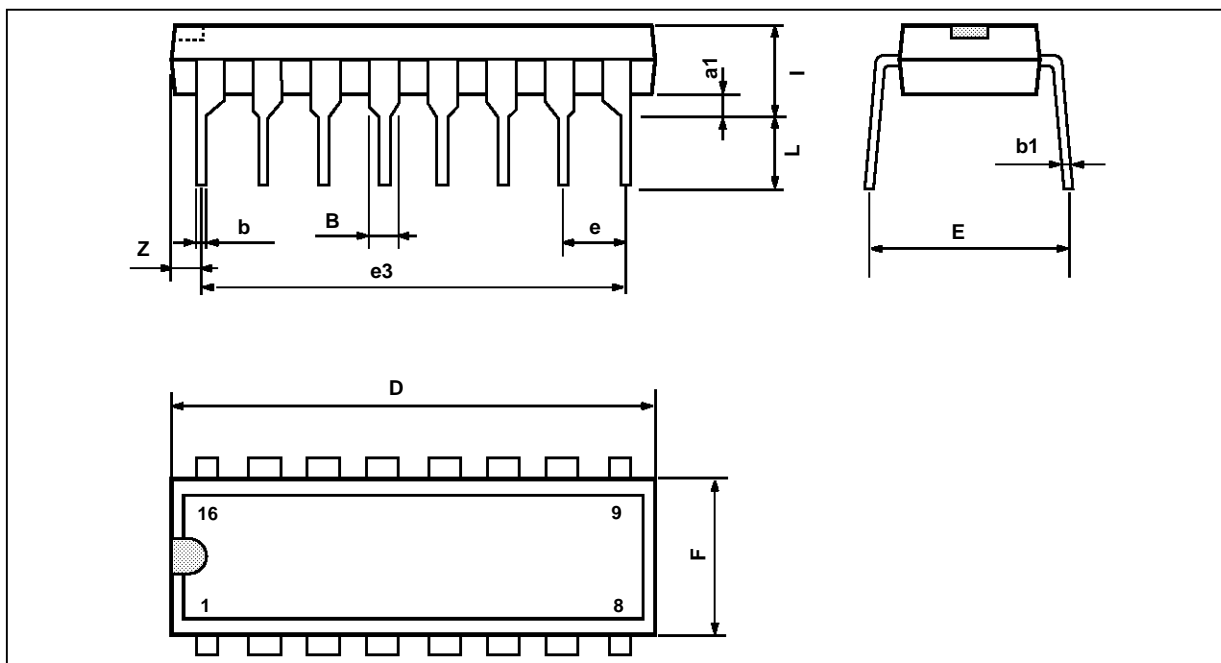
**Figure 6 : External Heatsink Mounting Example**



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



**PACKAGE MECHANICAL DATA**  
16 PINS - PLASTIC POWERDIP



PMDIP16W/EP5

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
a1	0.51			0.020		
B	0.85		1.4	0.033		0.055
b		0.5			0.020	
b1	0.38		0.5	0.015		0.020
D			20			0.787
E		8.8			0.346	
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

DIP16PW/TBL

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