

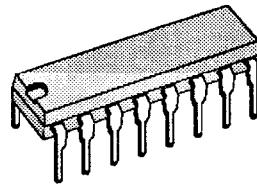


**SGS-THOMSON**  
MICROELECTRONICS

**TDA1175P**

## LOW-NOISE VERTICAL DEFLECTION SYSTEM

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



**POWERDIP16**  
(Plastic Package)

**ORDER CODE : TDA1175P**

### 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.

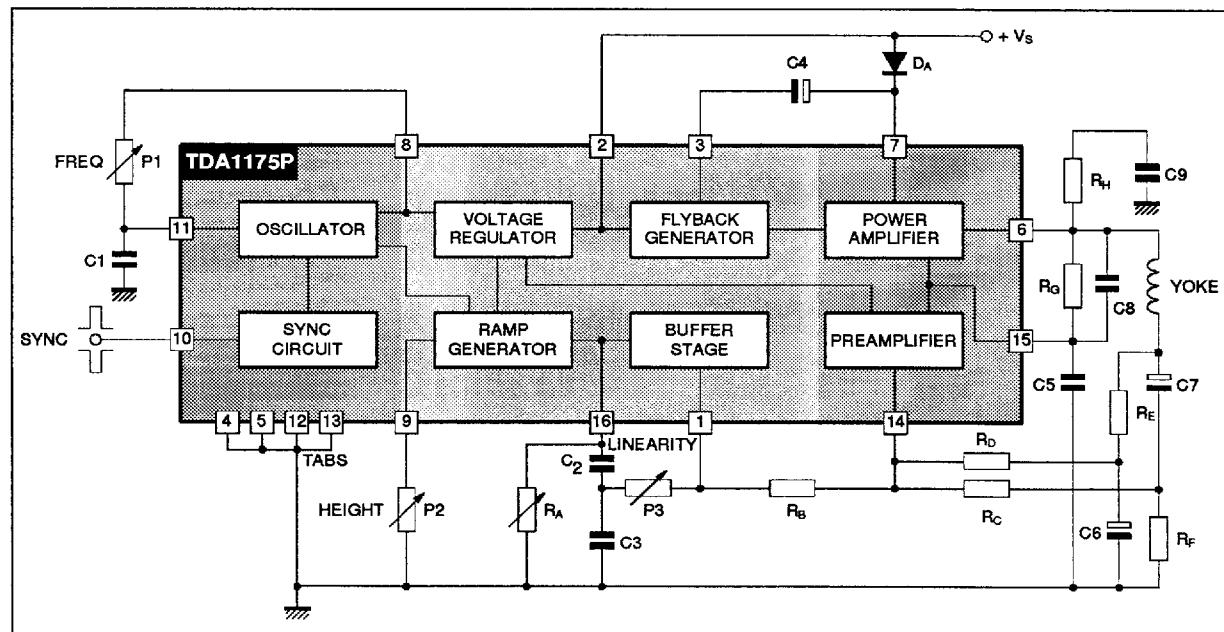
### PIN CONNECTIONS

RAMP OUTPUT	<input type="checkbox"/>	1	<input type="checkbox"/>	RAMP GENERATOR
SUPPLY VOLTAGE	<input type="checkbox"/>	2	<input type="checkbox"/>	COMPENSATION
FLYBACK	<input type="checkbox"/>	3	<input type="checkbox"/>	AMP. INPUT
GROUND	<input type="checkbox"/>	4	<input type="checkbox"/>	GROUND
GROUND	<input type="checkbox"/>	5	<input type="checkbox"/>	GROUND
POWER AMPLIFIER OUTPUT	<input type="checkbox"/>	6	<input type="checkbox"/>	OSCILLATOR
POWER AMPLIFIER SUPPLY VOLTAGE	<input type="checkbox"/>	7	<input type="checkbox"/>	SYNC. INPUT
REGULATED VOLTAGE	<input type="checkbox"/>	8	<input type="checkbox"/>	HEIGHT ADJUSTMENT

1175P01.EPS

# TDA1175P

## 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 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 W
$T_{stg}, T_j$	Storage and Junction Temperature	- 40, + 150	°C

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## THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{th(j-tab)}$	Thermal Resistance Junction-pin	Max. 12	°C/W
$R_{th(j-amb)}$	Thermal Resistance Junction-ambient	Max. 80	°C/W <sup>(1)</sup>

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

**ELECTRICAL CHARACTERISTICS (T<sub>amb</sub> = 25 °C, unless otherwise specified)**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit	Fig.
DC CHARACTERISTICS (Refer to the test circuits, V <sub>S</sub> = 35V)							
I <sub>2</sub>	Pin 2 Quiescent Current	I <sub>3</sub> = 0		7	14	mA	1b
I <sub>7</sub>	Pin 7 Quiescent Current	I <sub>6</sub> = 0		8	17	mA	1b
- I <sub>11</sub>	Oscillator Bias Current	V <sub>11</sub> = 1V		0.1	1	µA	1a
- I <sub>14</sub>	Amplifier Input Bias Current	V <sub>14</sub> = 1V		1	10	µA	1b
- I <sub>16</sub>	Ramp Generator Bias Current	V <sub>16</sub> = 0		0.02	0.3	µA	1a
- I <sub>16</sub>	Ramp Generator Current	I <sub>9</sub> = 20µA, V <sub>16</sub> = 0	18.5	20	21.5	µA	1b
$\frac{\Delta I_{16}}{I_{16}}$	Ramp Generator Non-linearity	$\Delta V_{16} = 0$ to 12V, I <sub>9</sub> = 20µA		0.2	1	%	1b
V <sub>S</sub>	Supply Voltage Range		10		35	V	
V <sub>1</sub>	Pin 1 Saturation Voltage to Ground	I <sub>1</sub> = 1mA		1	1.4	V	
V <sub>3</sub>	Pin 3 Saturation Voltage to Ground	I <sub>3</sub> = 10mA		1.5	2.5	V	1a
V <sub>6</sub>	Quiescent output Voltage	V <sub>S</sub> = 10V, R <sub>1</sub> = 1kΩ, R <sub>2</sub> = 1kΩ V <sub>S</sub> = 35V, R <sub>1</sub> = 3kΩ, R <sub>2</sub> = 1kΩ	4.1 8.2	4.4 8.8	4.7 9.4	V	1a
V <sub>6L</sub>	Output Saturation Voltage to Ground	- I <sub>6</sub> = 0.1A - I <sub>6</sub> = 0.8A		0.9 1.8	1.2 2.2	V V	1c 1c
V <sub>6H</sub>	Output Saturation Voltage to Supply	I <sub>6</sub> = 0.1A I <sub>6</sub> = 0.8A		1.4 2.8	2.1 3.1	V V	1d 1d
V <sub>8</sub>	Regulated Voltage at Pin 8		6.5	6.7	6.9	V	1b
V <sub>9</sub>	Regulated Voltage at Pin 9	I <sub>9</sub> = 20µA	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 35V		1	2	mV/V	1b
V <sub>14</sub>	Amplifier Input Reference Voltage	V <sub>10</sub> ≤ 0.4V	2.20	2.27	2.35	V	

**AC CHARACTERISTICS (Refer to the AC test circuit, V<sub>S</sub> = 22V, f = 50Hz)**

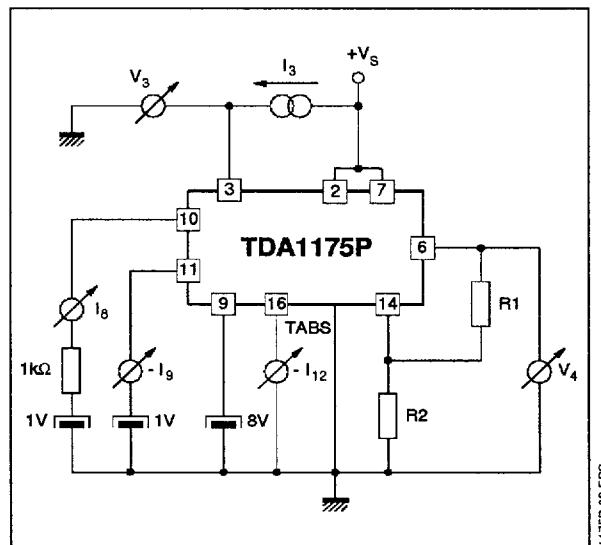
I <sub>s</sub>	Supply Current	I <sub>y</sub> = 1A <sub>PP</sub>		140		mA	2
I <sub>10</sub>	Sync. Input Current (positive or negative)		0.5		2	mA	2
V <sub>6</sub>	Flyback Voltage	I <sub>y</sub> = 1A <sub>PP</sub>		45		V	2
t <sub>fly</sub>	Flyback Time	I <sub>y</sub> = 1A <sub>PP</sub>		0.7		ms	2
V <sub>ON</sub>	Peak to Peak Output Noise	Pin 11 Connected to GND		18	30	mV <sub>pp</sub>	2
f <sub>o</sub>	Free Running Frequency	(P <sub>1</sub> + R <sub>1</sub> ) = 300kΩ C <sub>9</sub> = 0.1 µF	36	43.5		Hz	2
f <sub>OPER</sub>	Operating Frequency Range		10		120	Hz	2
Δf	Synchronization Range	I <sub>10</sub> = 0.5mA, C <sub>9</sub> = 0.1µF (P <sub>1</sub> +R <sub>1</sub> ) = 300kΩ	14			Hz	2
$\frac{\Delta f}{\Delta V_S}$	Frequency Drift with Supply Voltage	V <sub>S</sub> = 10 to 35V		0.005		Hz/V	2
$\frac{ \Delta f }{\Delta T_{ab}}$	Frequency Drift with tab Temperature	T <sub>tab</sub> = 40 to 120°C		0.01		Hz/°C	2

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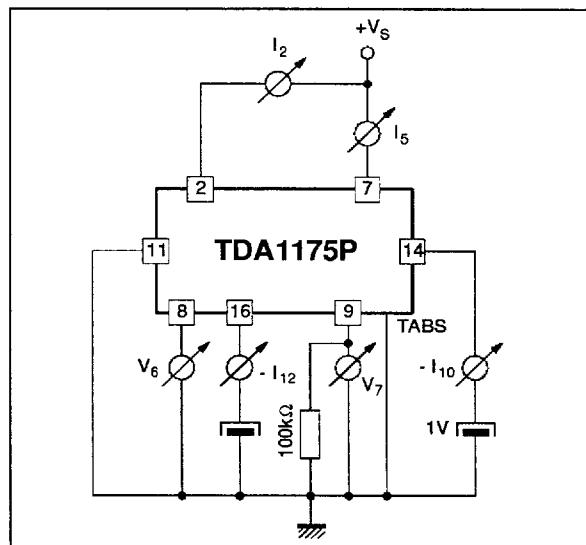
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**Figure 1 : DC Test Circuits**

**Figure 1a**



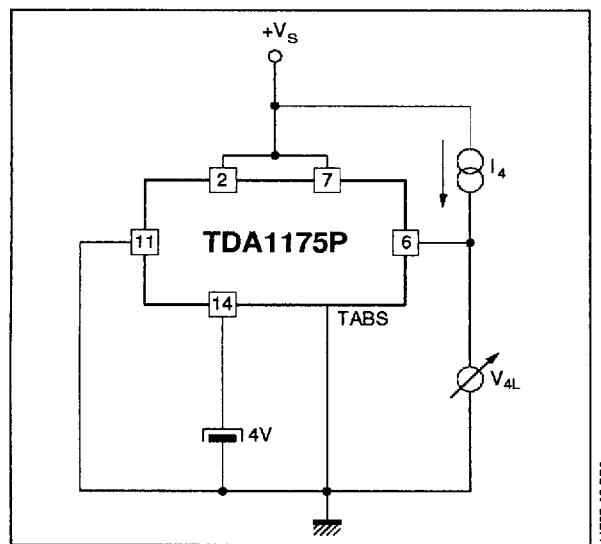
**Figure 1b**



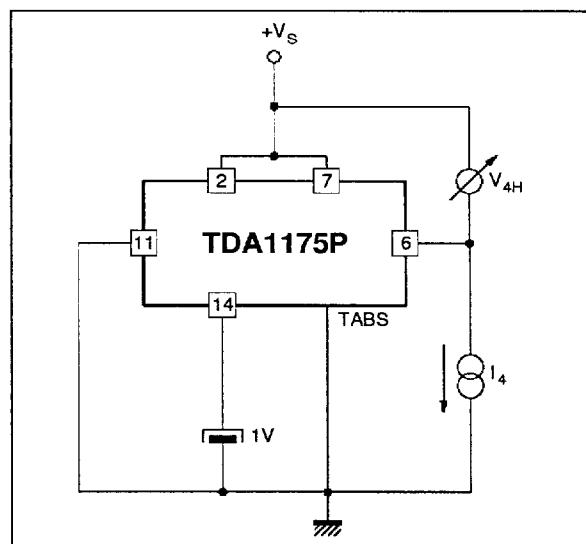
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**Figure 1c**



**Figure 1d**



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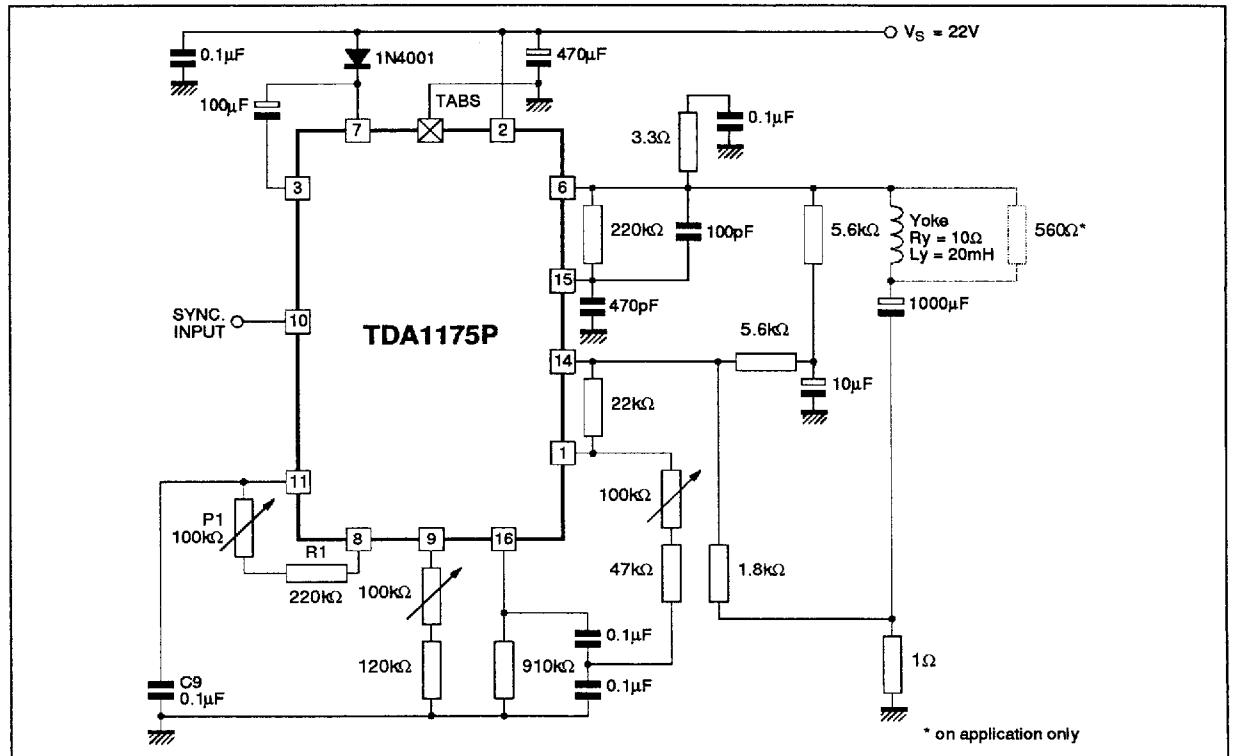
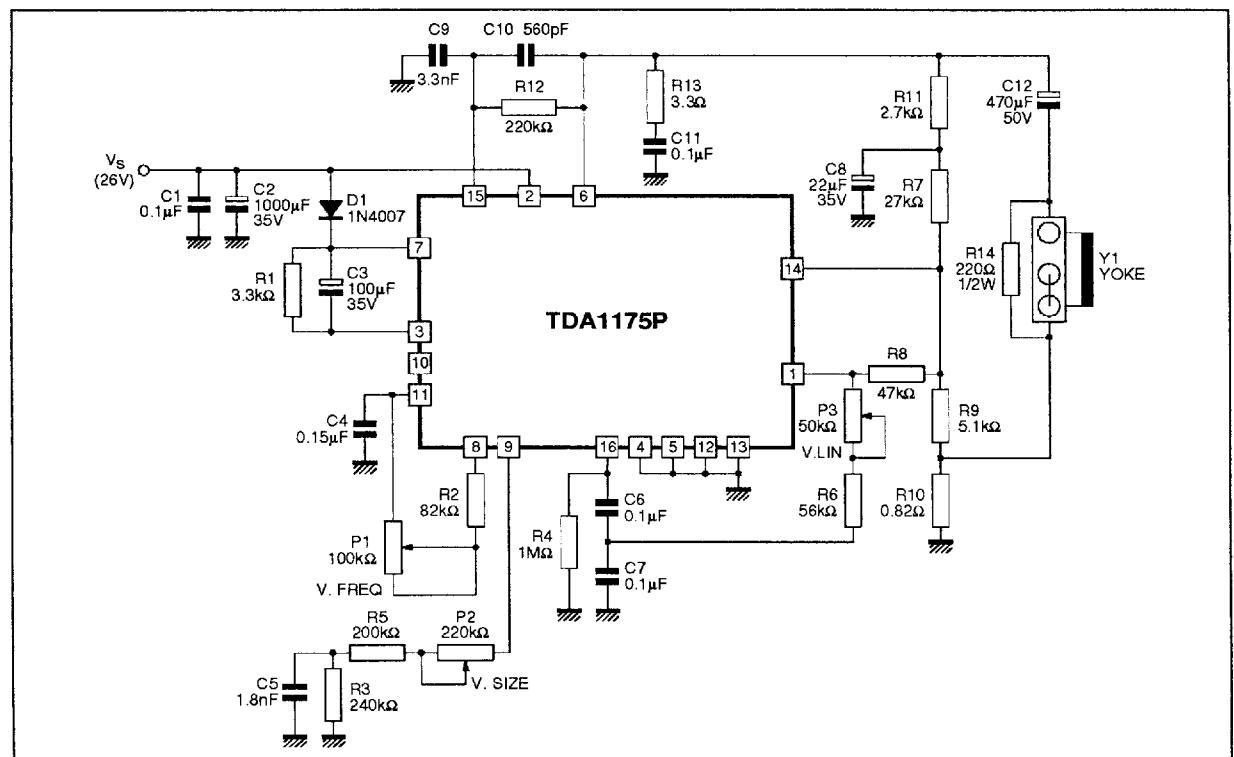
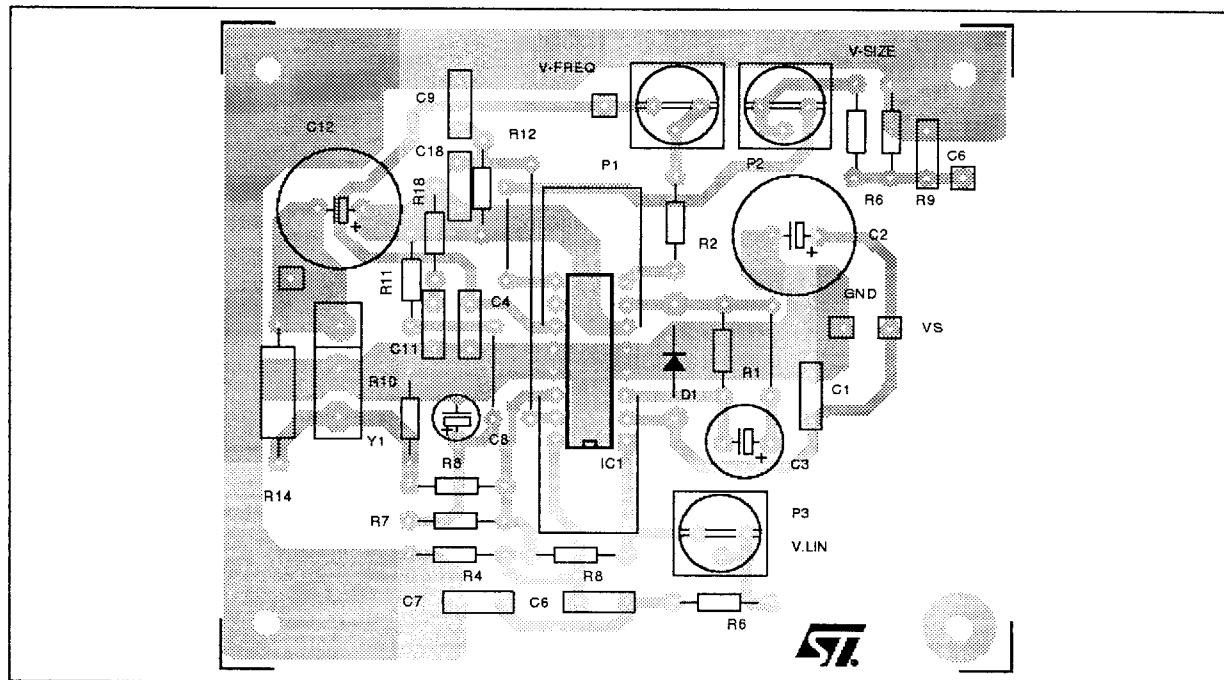
**Figure 2 : AC Test and Application Circuit for Large Screen B/W TV Set  $10\Omega/20mH/1A_{PP}$** **Figure 3 : Typical Application Circuit for VGA Monitor ( $R_Y = 10\Omega$ ,  $L_Y = 20mH$ ,  $I_Y = 0.8A_{PP}$ )**

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



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## 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

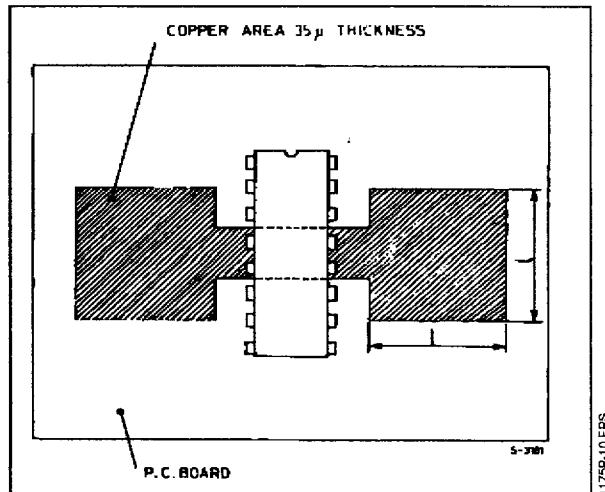
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## MOUNTING INSTRUCTION

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 dissipable 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**

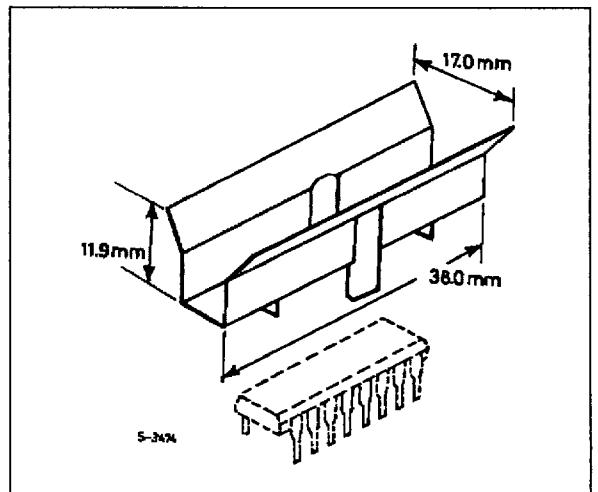


having a thickness of  $35\mu$  (1.4 mils).

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

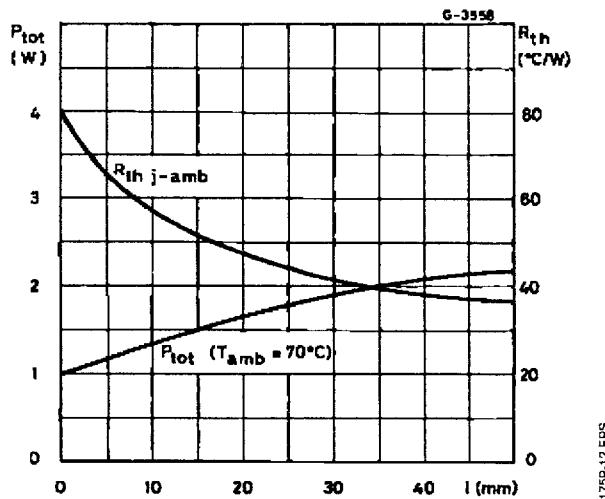
The external heatsink or printed circuit copper area must be connected to electrical ground.

**Figure 6 : External Heatsink Mounting Example**

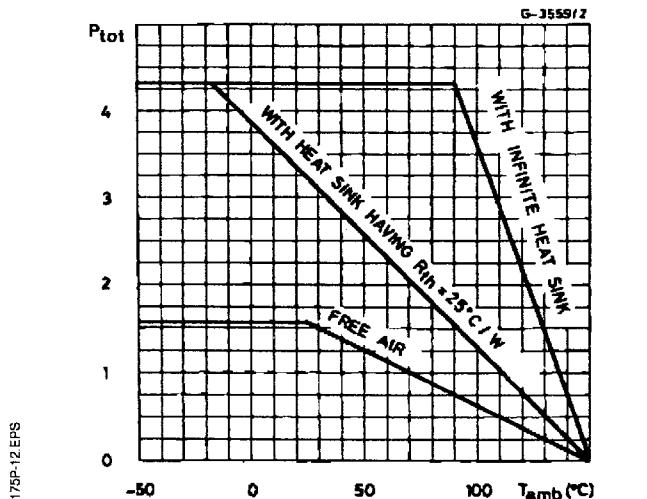


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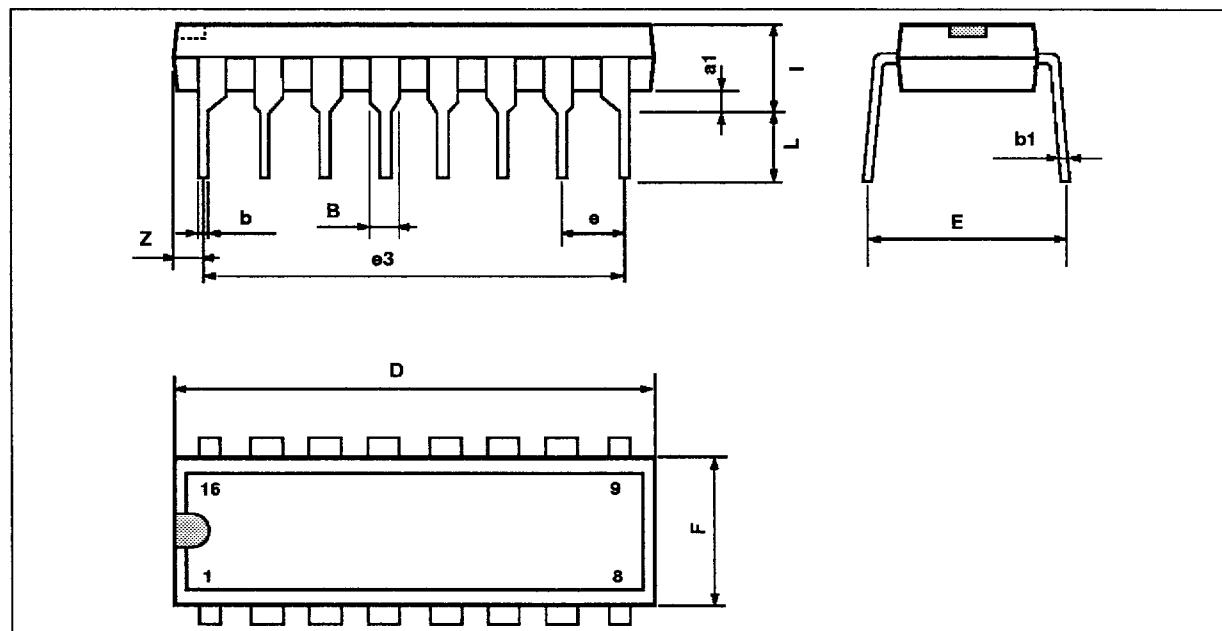
**Figure 7 : Maximum Power Dissipation and Junction-ambient Thermal Resistance versus "l"**



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



1175P-13.EPS

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


PN1175P16W.EPS

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

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