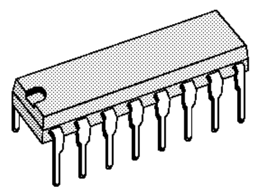
SGS-THOMSON MICROELECTRONICS

TDA1175P

LOW-NOISE VERTICAL DEFLECTION SYSTEM

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



POWERDIP16
(Plastic Package)

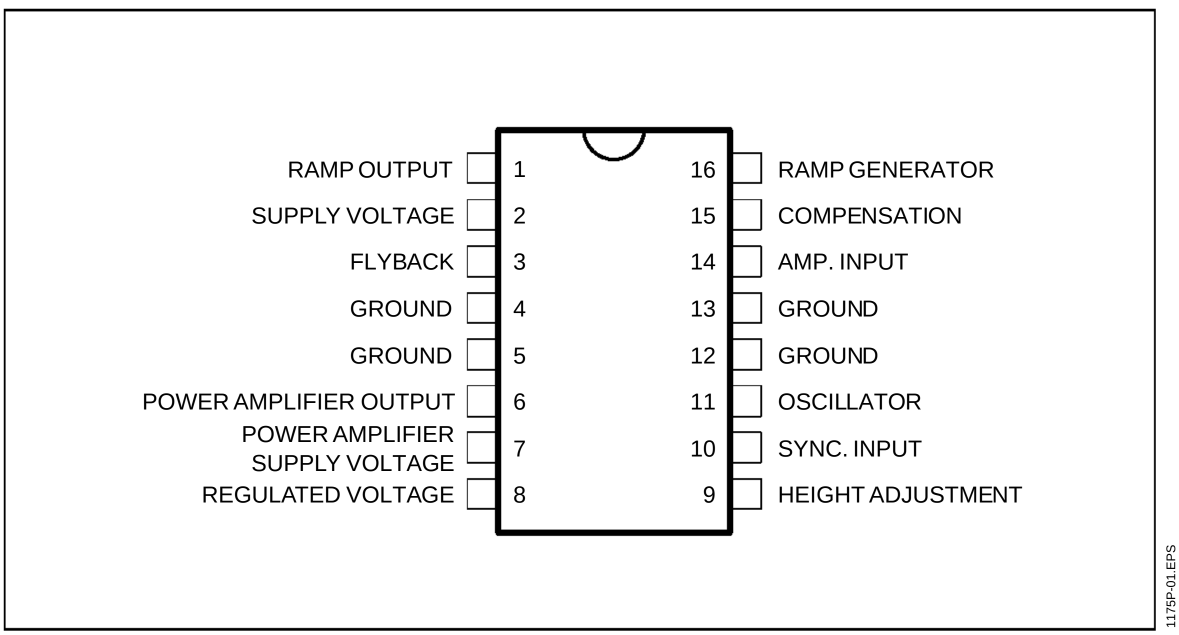
ORDER CODE : TDA1175P

DESCRIPTION

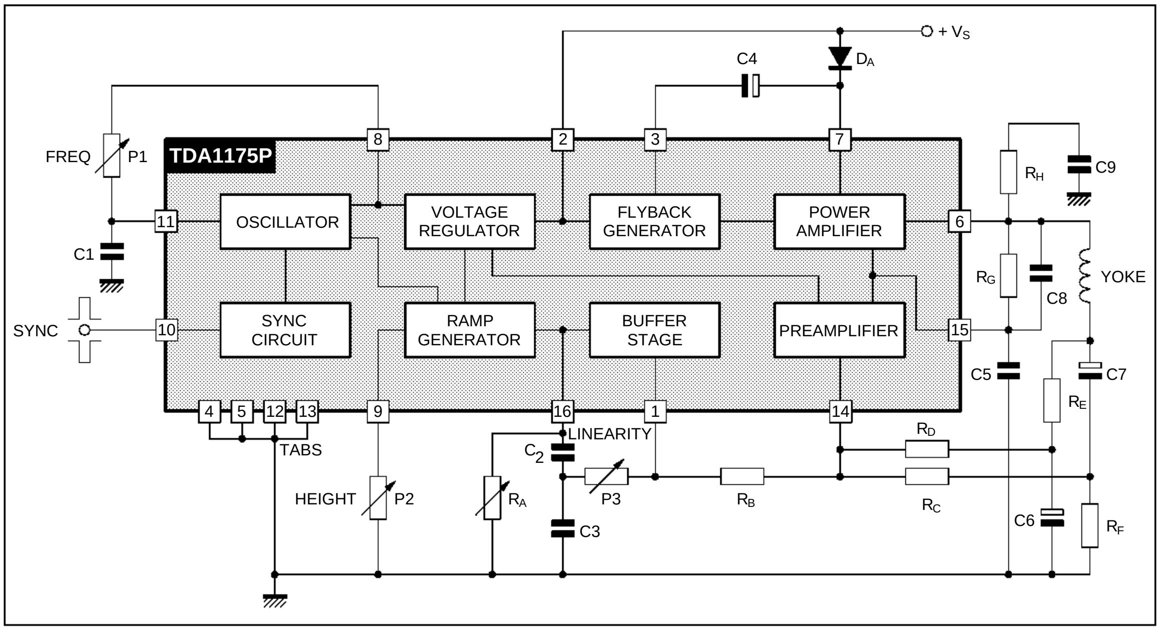
The TDA1175P is a monolithic integrated circuit in POWERDIP16 plastic package. It is intended for use in black and white and colour TV receivers. Low-noise makes this device particularly suitable for use in monitors.

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

PIN CONNECTIONS



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 = 2ms	2	A
I_o	Output Peak Current at f = 50Hz, $t \leq 10\mu s$	2.5	A
I_o	Output Peak Current at f = 50Hz, $t > 10\mu s$	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 = 50Hz, $t_{fly} \leq 1.5ms$	1.8	A
I_{10}	Pin 10 Current	± 20	mA
P_{tot}	Power Dissipation : at T_{tab} = 90°C at T_{amb} = 70°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
$R_{th\ (j\text{-}tab)}$	Thermal Resistance Junction-pin	Max.	12	°C/W
$R_{th\ (j\text{-}amb)}$	Thermal Resistance Junction-ambient	Max.	80	°C/W (1)

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

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit	Fig.
DC CHARACTERISTICS (Refer to the test circuits, V_S = 35V)							
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	µA	1a
$-I_{14}$	Amplifier Input Bias Current	V_{14} = 1V		1	10	µA	1b
$-I_{16}$	Ramp Generator Bias Current	$V_{16} = 0$		0.02	0.3	µA	1a
$-I_{16}$	Ramp Generator Current	I_9 = 20µA, $V_{16} = 0$	18.5	20	21.5	µA	1b
$\frac{\Delta I_{16}}{I_{16}}$	Ramp Generator Non-linearity	ΔV_{16} = 0 to 12V, I_9 = 20µA		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		1.5	2.5	V	1a
V_6	Qiuescent output Voltage	V_s = 10V, R1 = 1kΩ, R2 = 1kΩ V_s = 35V, R1 = 3kΩ, R2 = 1kΩ	4.1 8.2	4.4 8.8	4.7 9.4	V V	1a 1a
V_{6L}	Output Saturation Voltage to Ground	$-I_6$ = 0.1A $-I_6$ = 0.8A		0.9 1.8	1.2 2.2	V v	1c 1c
V_{6H}	Output Saturation Voltage to Supply	I_6 = 0.1A I_6 = 0.8A		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 = 20µA	6.6	6.8	7	V	1b
$\frac{\lvert\Delta V_8\rvert}{\Delta V_S}, \frac{\lvert\Delta V_9\rvert}{\Delta V_S}$	Regulated Voltage Drift with Supply Voltage	ΔVs = 10 to 35V		1	2	mV/V	1b
V_{14}	Amplifier Input Reference Voltage	$V_{10} \leq$ 0.4V	2.20	2.27	2.35	V	
AC CHARACTERISTICS (Refer to the AC test circuit, V_S = 22V, f = 50Hz)							
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) = 300kΩ C9 = 0.1 µF	36	43.5		Hz	2
f_{OPER}	Operating Frequency Range		10		120	Hz	2
Δf	Synchronization Range	I_{10} = 0.5mA, C9 = 0.1µF (P1+R1) = 300kΩ	14			Hz	2
$\frac{\Delta f}{\Delta V_S}$	Frequency Drift with Supply Voltage	V_s = 10 to 35V		0.005		Hz/V	2
$\frac{\lvert\Delta f\rvert}{\Delta T_{ab}}$	Frequency Drift with tab Temperature	T_{tab} = 40 to 120°C		0.01		Hz/°C	2

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Figure 1 : DC Test Circuits

Figure 1a

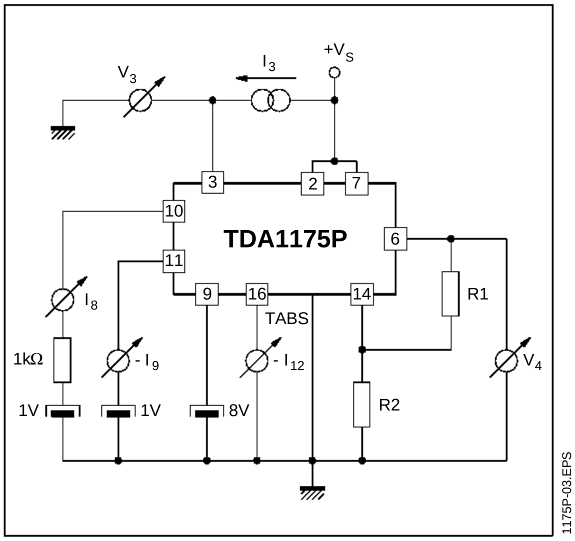

Figure 1b

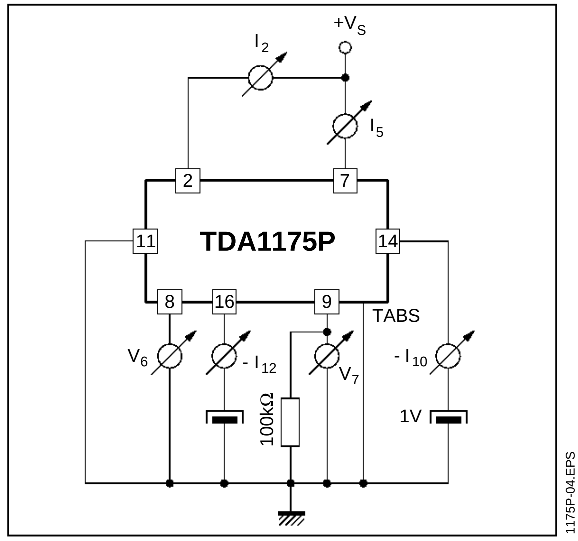

Figure 1c

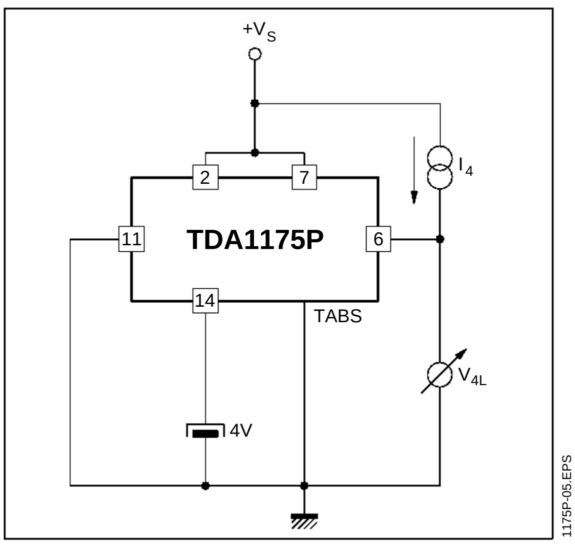

Figure 1d

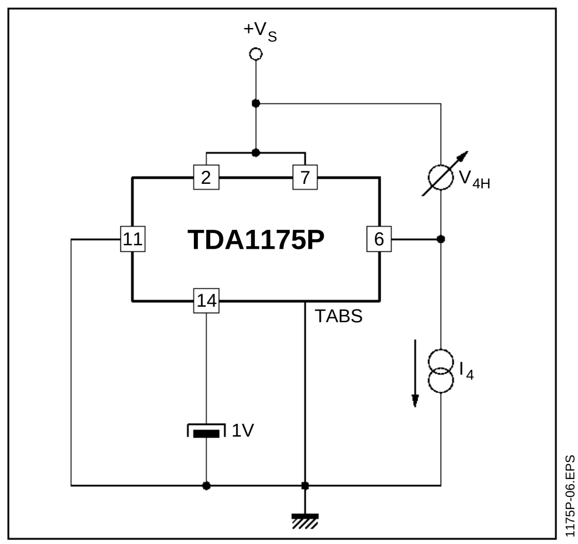

Figure 2 : AC Test and Application Circuit for Large Screen B/W TV Set 10Ω/20mH/1A$_{PP}$

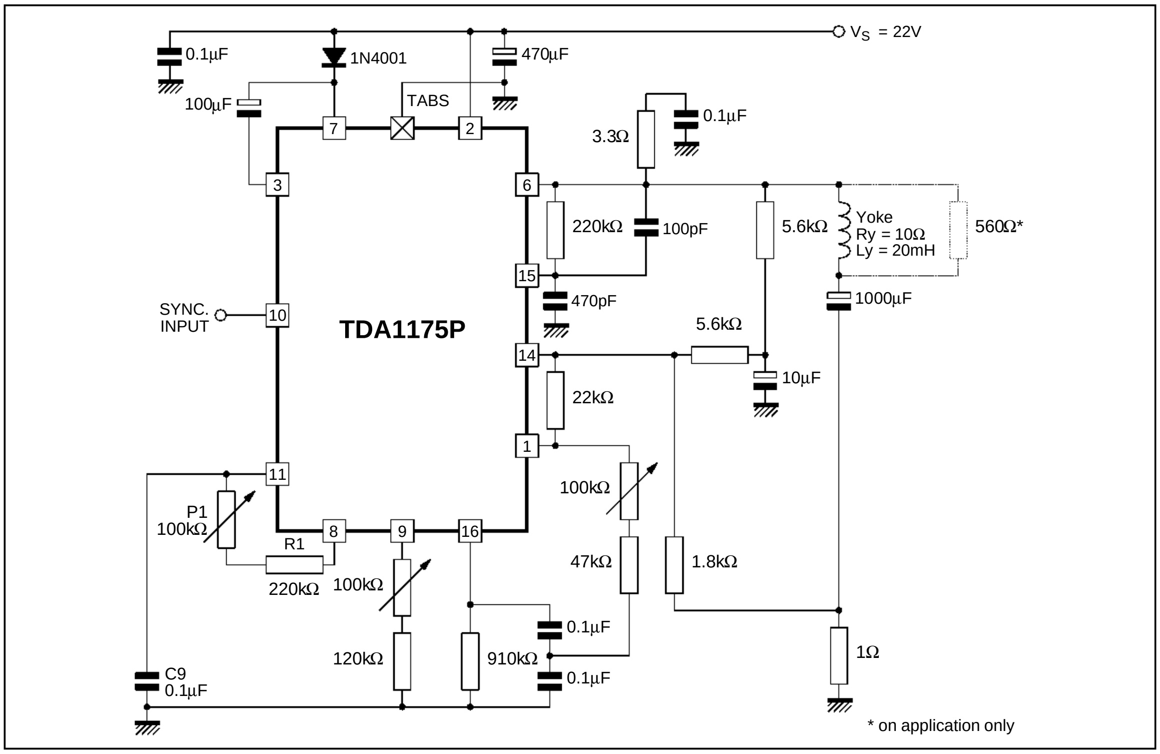

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Figure 3 : Typical Application Circuit for VGA Monitor (R_Y = 10Ω, L_Y = 20mH, I_Y = 0.8A$_{PP}$)

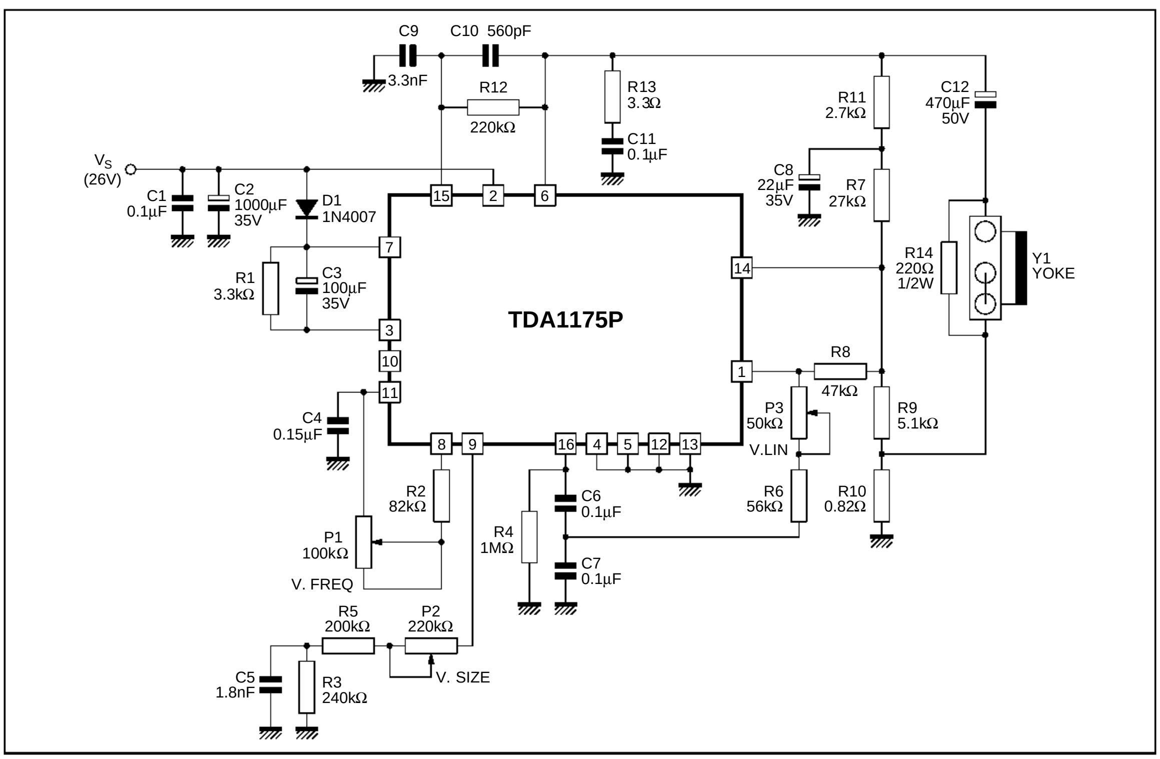

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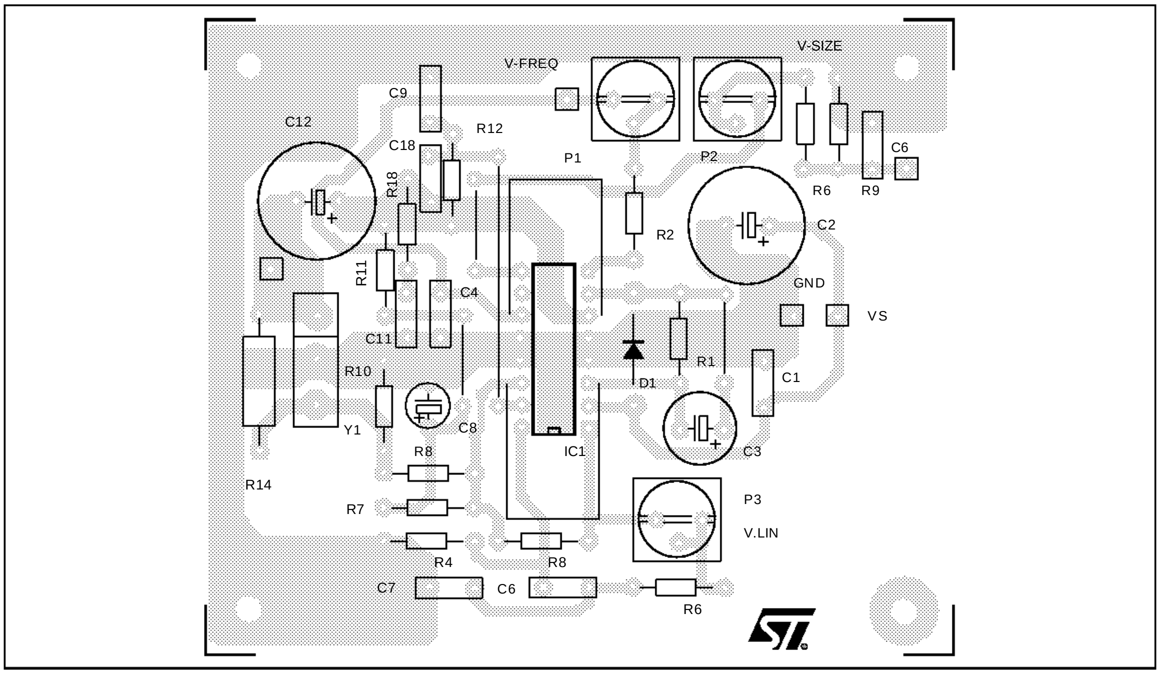
Figure 4 : P.C. Board and Components Layout of the Circuit of Figure 3 (1:1 scale)



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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 $R_{th\ (j\text{-}a)}$ 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 $R_{th\ (j\text{-}a)}$ as a function of the side "l" of two equal square copper areas having a thicknessof 35µ (1.4 mils).

During soldering the pins 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.

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

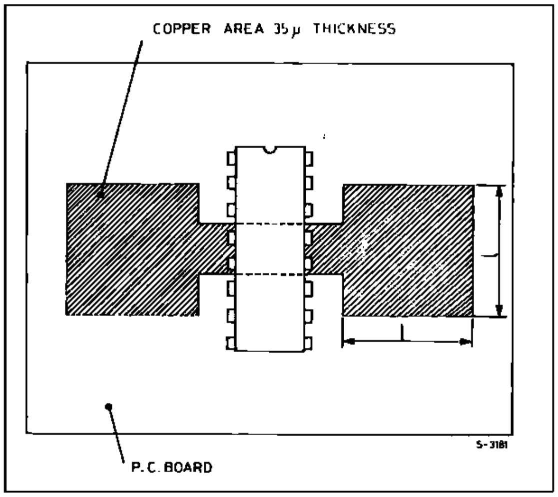


Figure 6 : External Heatsink Mounting Example

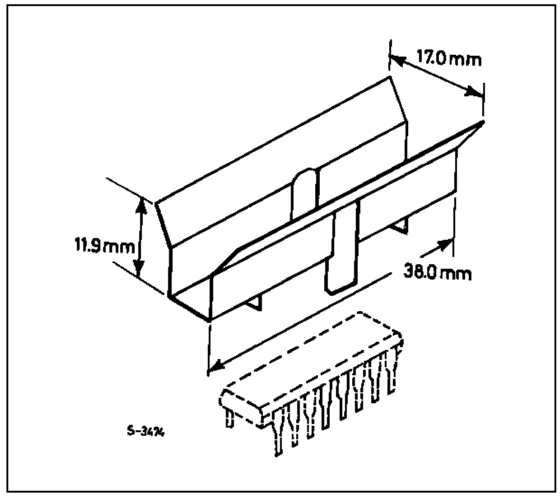


Figure 7 : Maximum Power Dissipation and Junction-ambient Thermal Resistance versus "l"

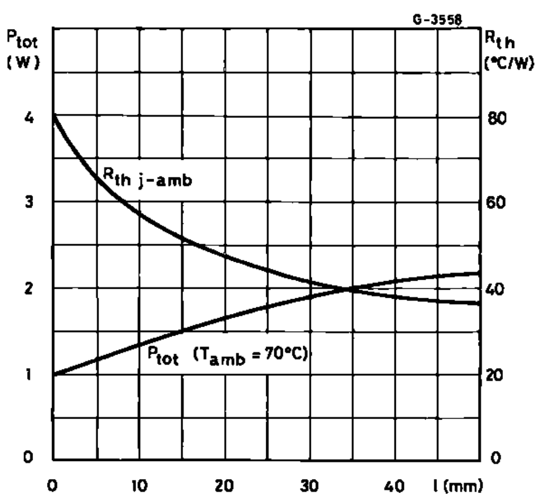
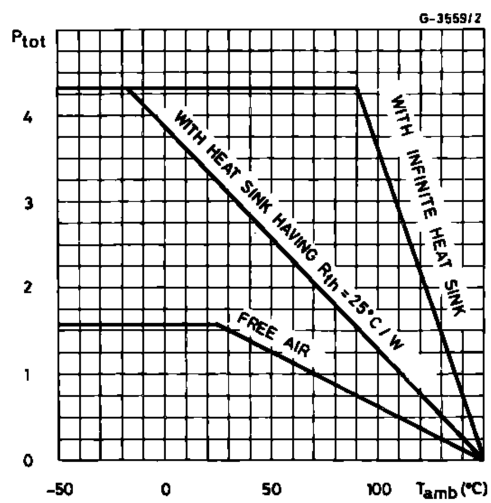
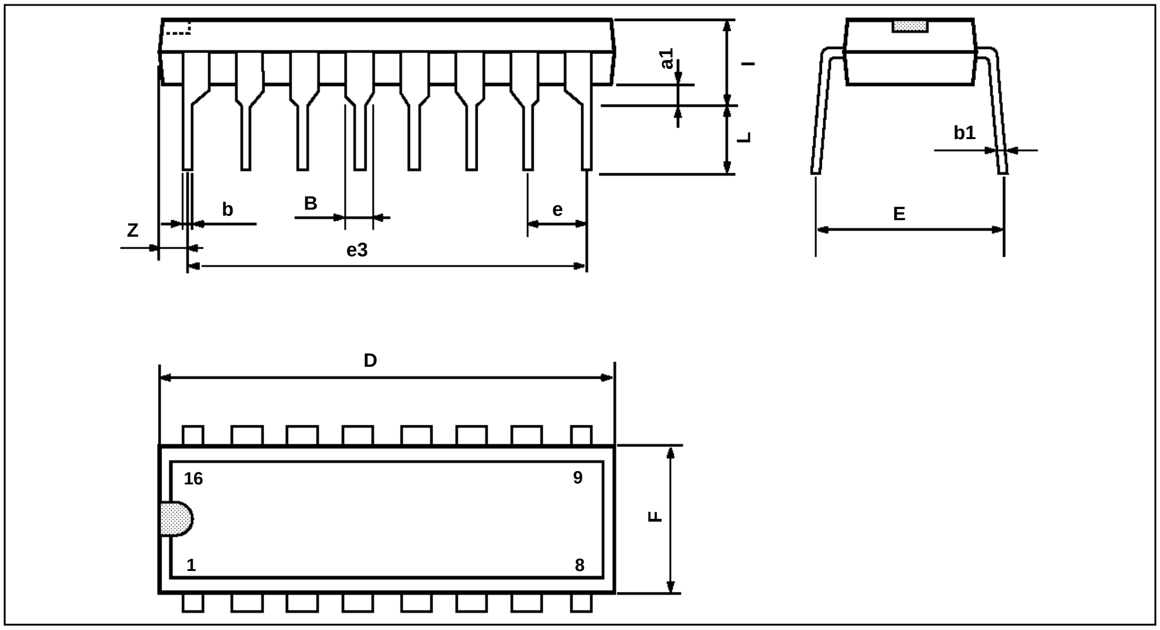


Figure 8 : Maximum Allowable Power Dissipation versus Ambient Temperature



PACKAGE MECHANICAL DATA

16 PINS - PLASTIC POWERDIP



PMDIP16W.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

DIP16PW.TBL