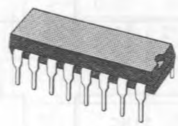
SGS-THOMSON MICROELECTRONICS

TDA1170D

LOW-NOISE TV VERTICAL DEFLECTION SYSTEM

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



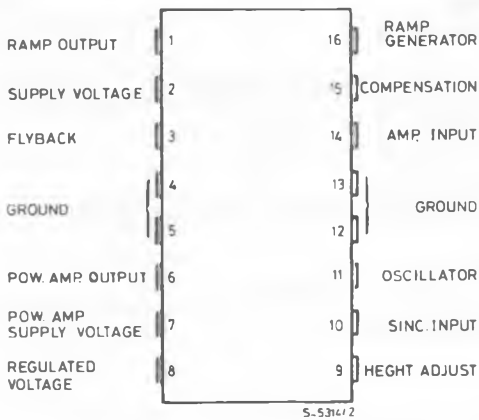
DIP16

ORDER CODE : TDA1170D

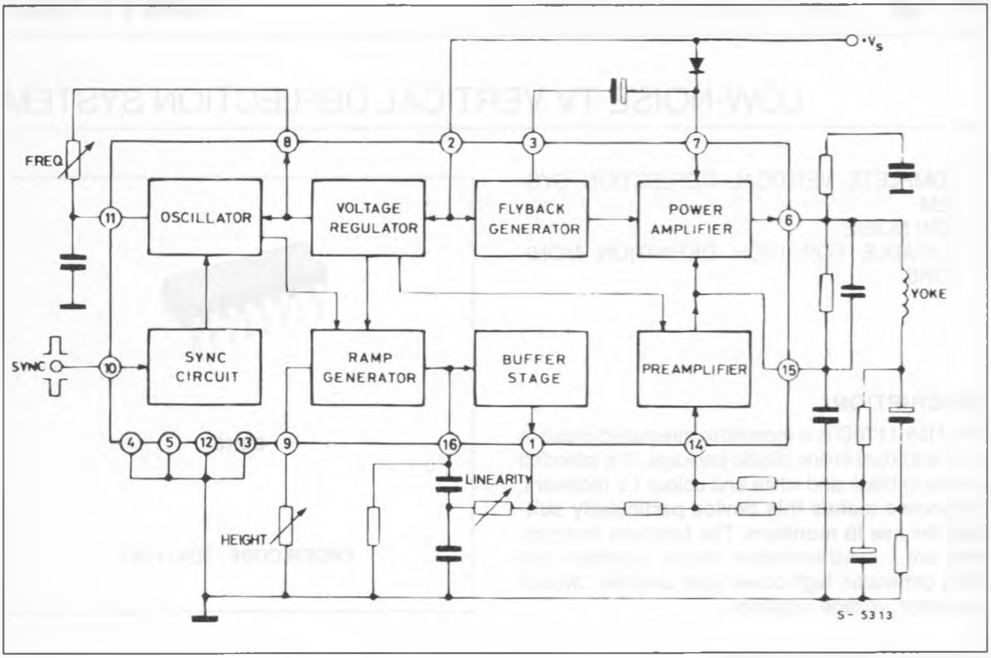
DESCRIPTION

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.

CONNECTION DIAGRAM



BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_S	Supply Voltage at Pin 2	35	V
V6, V7	Flyback Peak Voltage	60	V
V14	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 Prak Current at f = 50 Hz t > 10 µsec	1.5	A
I_3	Pin 3 DC Current at V6 < 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_{10}	Pin 10 Current	± 20	mA
P_{tot}	Power Dissipation : at T_{tab} = 90 °C at T_{amb} = 70 ° C (free air)	4.3 1	W W
T_{stg}, T_j	Storage and Junction Temperature	– 40 to 150	°C

THERMAL DATA

$R_{th\ j-tab}$ $R_{th\ j-amb}$	Thermal Resistance Junction–pins Thermal Resistance Junction-ambient	Max Max	14 80	°C/W °C/W(°)

(°) Obtained with pins 4, 5, 12, 13 soldered to printed circuit with minimized copper area.

ELECTRICAL CHARACTERISTICS (refer to the test circuits, V_s = 35 V, T_{amb} = 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_7	Pin 7 Quiescent Current	I_6 = 0		8	17	mA	1b
$-I_{11}$	Oscillator Bias Current	V11 = 1 V		0.1	1	μA	1a
$-I_{14}$	Amplifier Input Bias Current	V14 = 1 V		1	10	μA	1b
$-I_{16}$	Ramp Generator Bias Current	V16 = 0		0.02	0.3	μA	1a
$-I_{16}$	Ramp Generator Current	I_9 = 20 μA V16 = 0	18.5	20	21.5	μA	1b
$\frac{\Delta I_{16}}{I_{16}}$	Ramp Generator Non-linearity	ΔV16 = 0 to 12 V I_9 = 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
V6	Quiescent 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
V6L	Output Saturation Voltage to Ground	$-I_6$ = 0.1 A		0.9	1.2	V	1c
		$-I_6$ = 0.8 A		1.9	2.3	V	1c
V6H	Output Saturation Voltage to Supply	I_6 = 0.1 A		1.4	2.1	V	1d
		I_6 = 0.8 A		2.8	3.2	V	1d
V8	Regulated Voltage at Pin 8		6.1	6.5	6.9	V	1b
V9	Regulated Voltage at Pin 9	I_9 = 20 μA	6.2	6.6	7	V	1b
$\frac{\Delta V8}{\Delta V_s}$, $\frac{\Delta V9}{\Delta V_s}$	Regulated Voltage Drift with Supply Voltage	ΔV_s = 10 to 35 V		1		mV/V	1b
V14	Amplifier Input Reference Voltage		2.07	2.2	2.3	V	–
R10	Pin 10 Input Resistance	V10 ≤ 0.4 V	1			MΩ	1a

Figure 1 : DC Test Circuit.

Figure 1a.

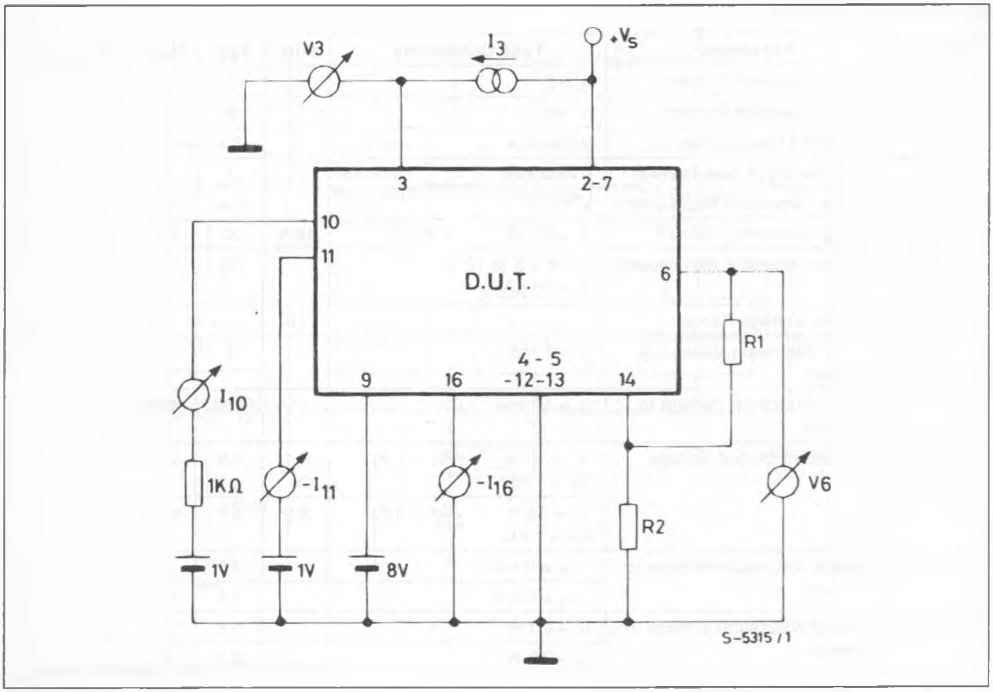


Figure 1b.

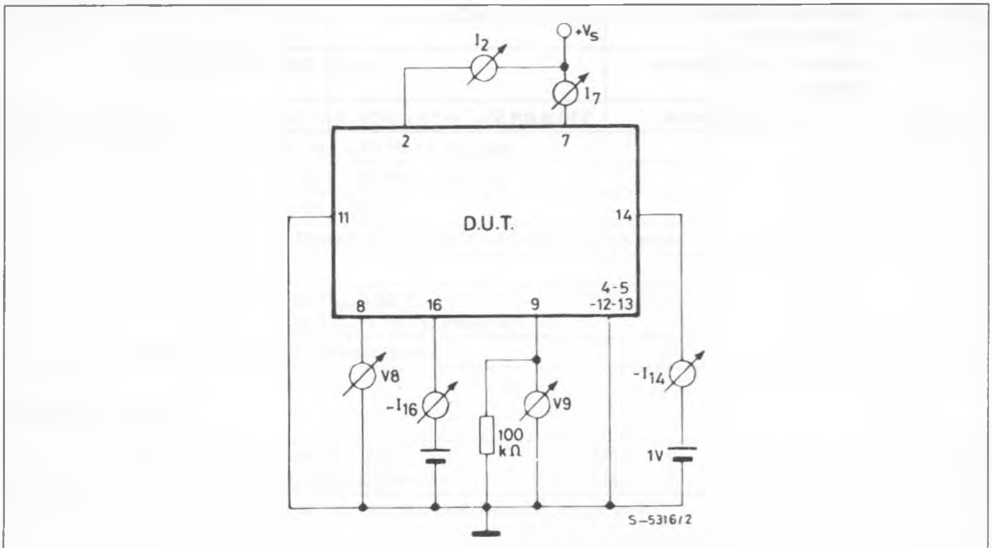


Figure 1c.

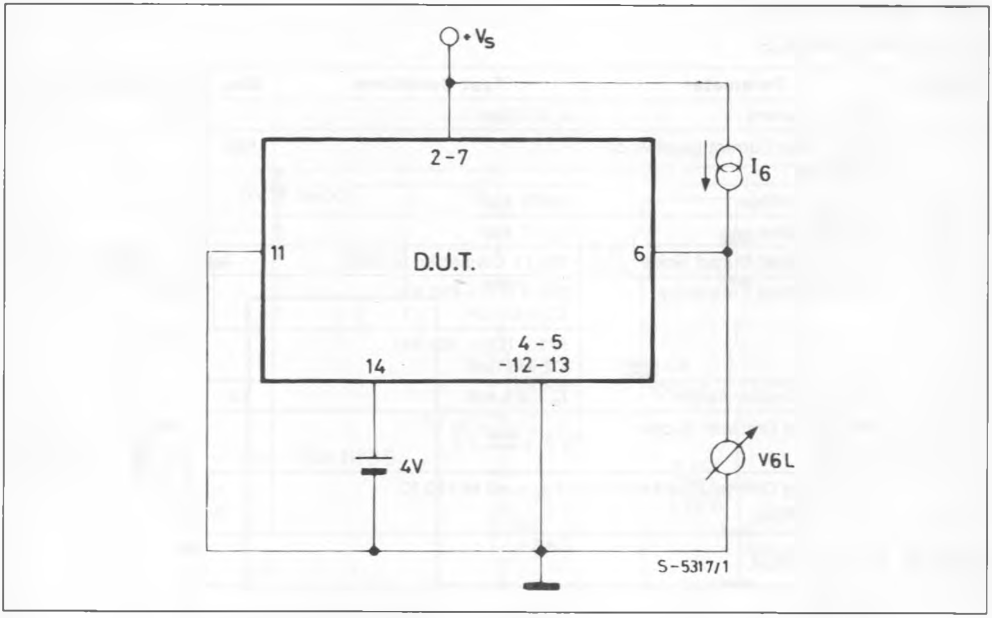
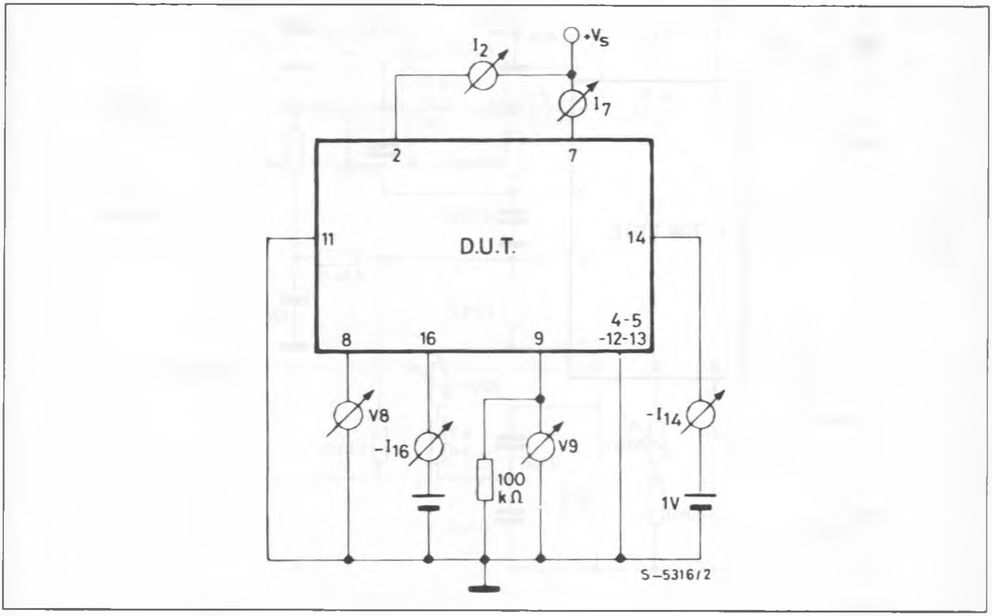


Figure 1d.



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_{10}	Sync. Input Current (positive or negative)		500			μA
V6	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 11 Connected to GND			40	mVpp
f_o	Free Running Frequency	(P1 + R1) = 260 KΩ C2 = 0.1 μF		48.5		Hz
		(P1 + R1) = 300 KΩ C2 = 0.1 nF		42.2		Hz
Δf	Synchronization Range	I_8 = 0.5 mA	14			Hz
$\frac{\Delta f}{\Delta Vs}$	Frequency Drift with Supply Voltage	V_s = 10 to 35 V		0.005		Hz/V
$\frac{\Delta f}{\Delta T_{pins}}$	Frequency Drift vs. Pins 4, 5, 12 and 13 Temp.	T_{tab} = 40 to 120 °C		0.01		Hz/°C

Figure 2 : AC Test Circuit.

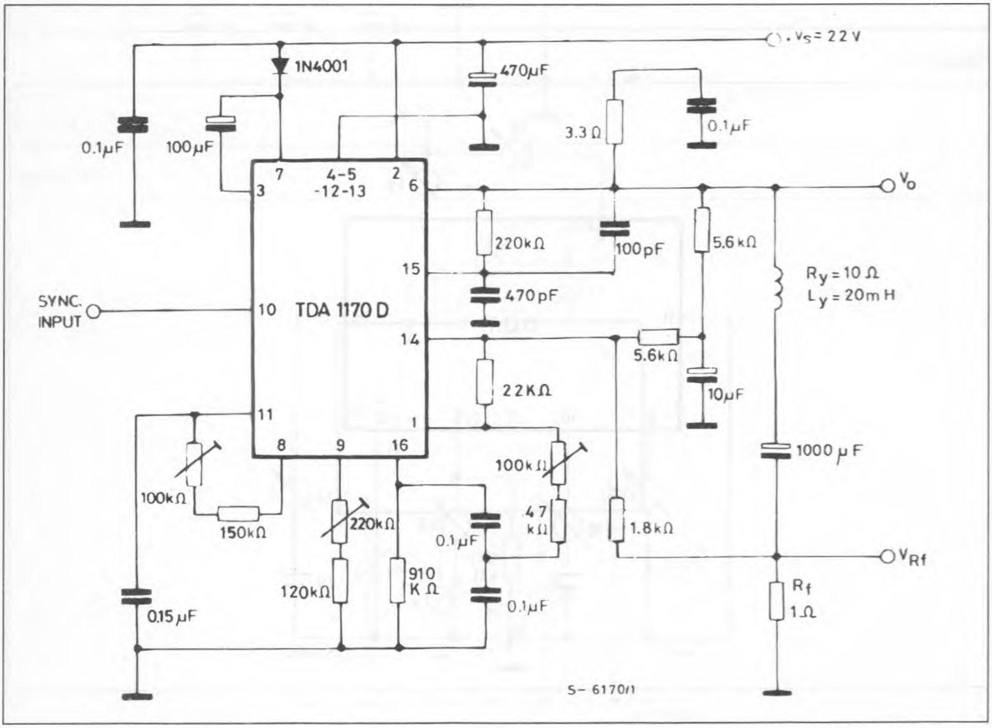


Figure 3 : Typical Application Circuit for Smal Screen B/W TV SET (Ry = 2.9 Ω, Ly = 6 mH, Iy = 1.1 App).

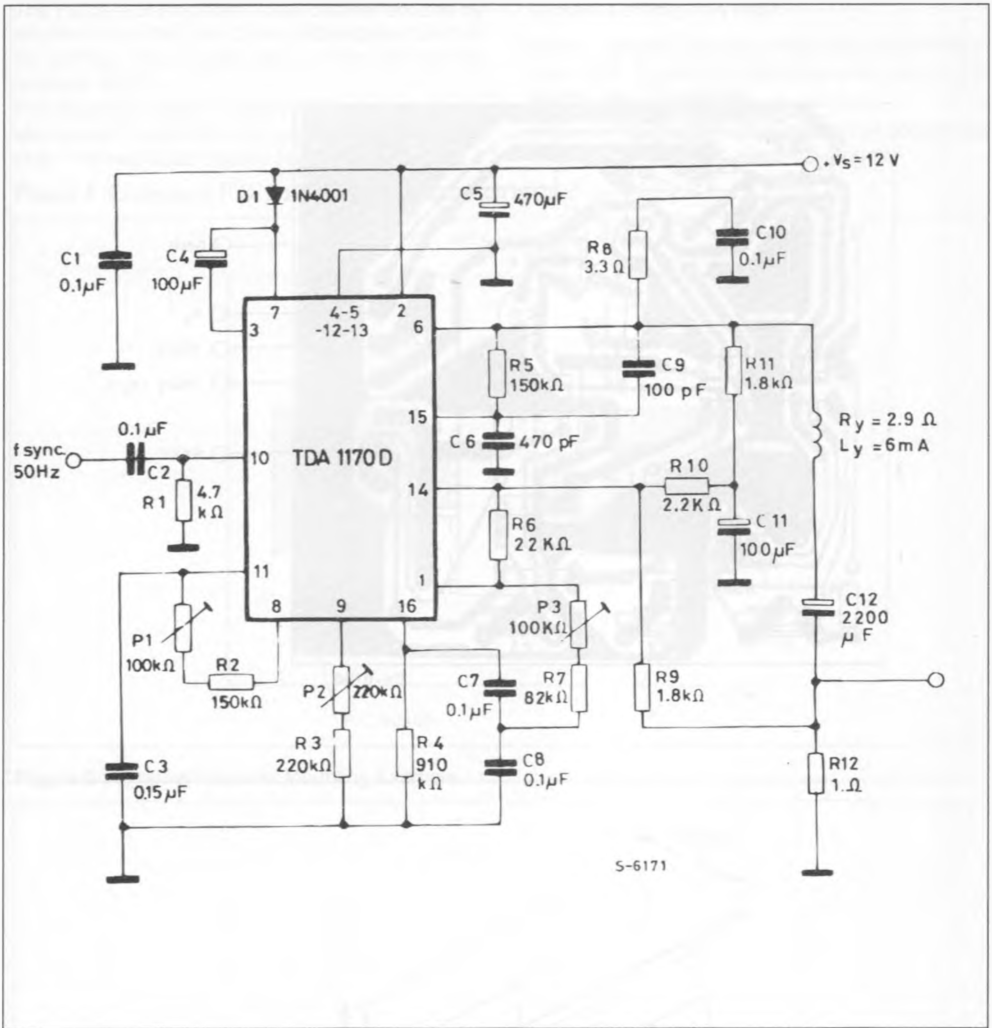
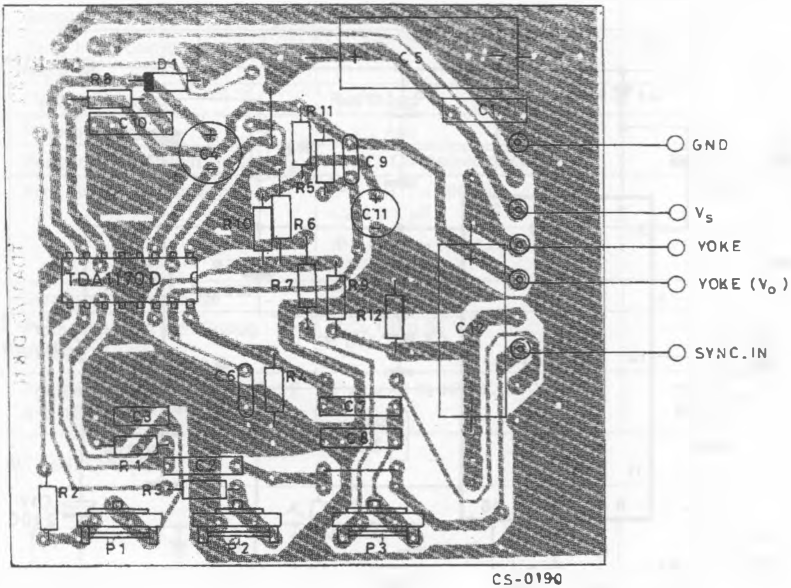


Figure 4 : P.C. Board and Components Layout of the Circuit of Fig. 3 (1 : 1 scale).



MOUNTING INSTRUCTION

The $R_{th\ j\text{-}amb}$ 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 dissipable power P_{tot} and the $R_{th\ j\text{-}amb}$ as a function of the side "l" of two equal square copper areas having a thickness of 35 μ (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 which is Used as Heatsink.

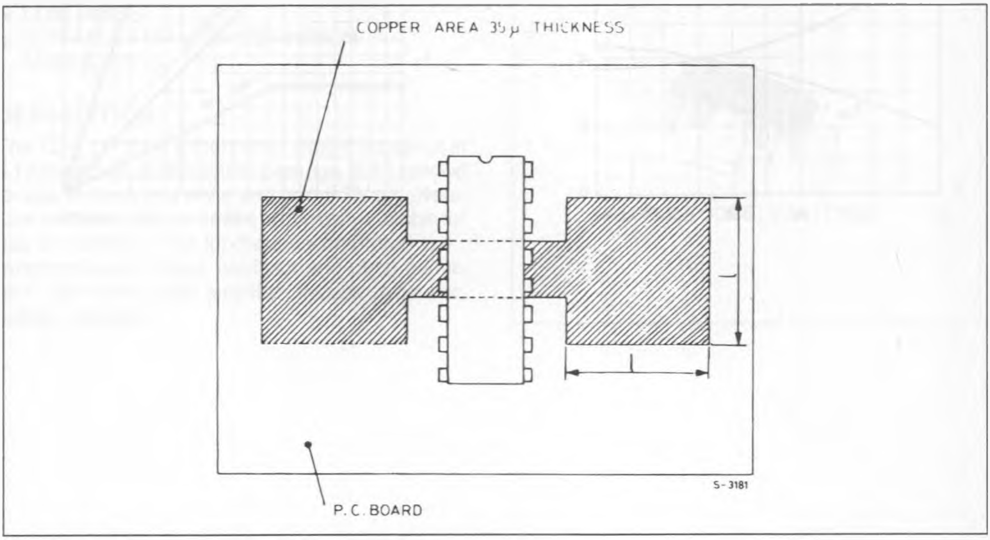


Figure 6 : External Heatsink Mounting Example.

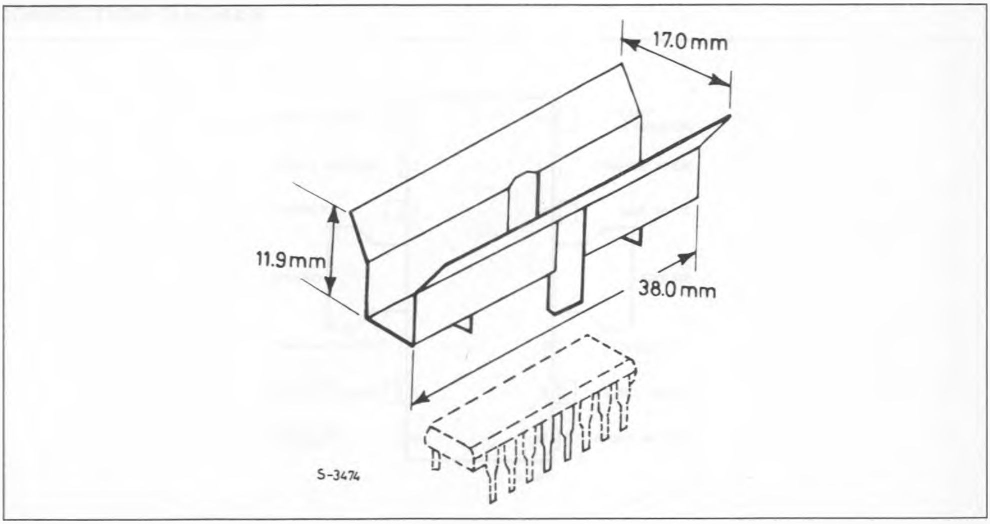


Figure 7 : Maximum Dissipable Power and Junction to Ambient Thermal Resistance vs. Side "l".

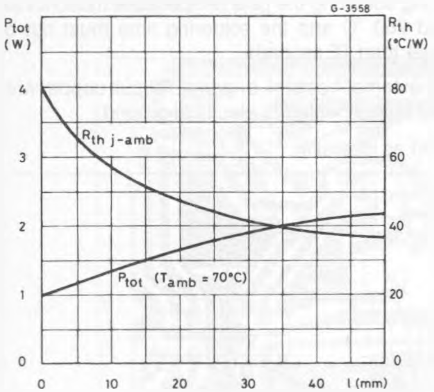


Figure 8 : Maximum Allowable Power Dissipation vs. Ambient Temperature.