



SGS-THOMSON
MICROELECTRONICS

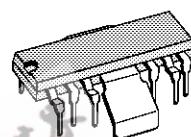
TDA1170N

LOW-NOISE TV VERTICAL DEFLECTION SYSTEM

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

DESCRIPTION

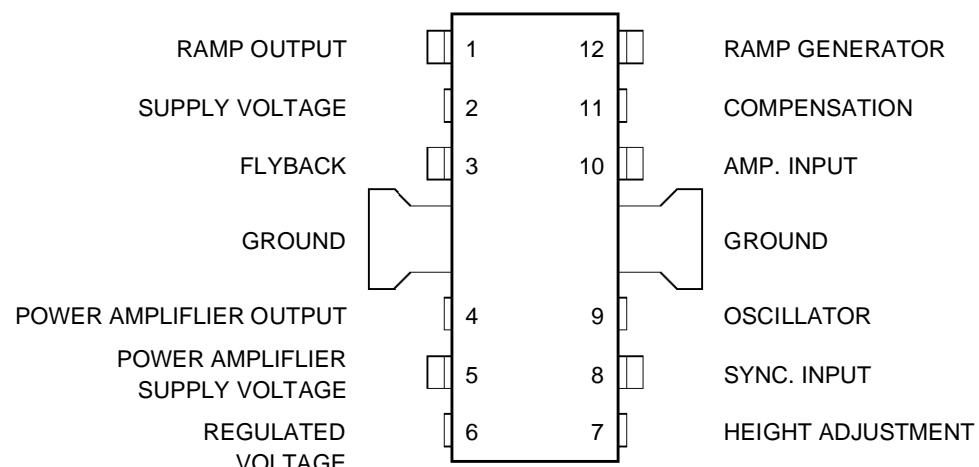
The TDA1170N is a monolithic integrated circuit in a 12-lead quad in-line plastic package. It is intended for use in black and white and colour TV receivers. Low-noise makes this device particularly suitable for use in monitors. The functions incorporated are : synchronization circuit, oscillator and ramp generator, high power gain amplifier, flyback generator, voltage regulator.



FINDIP12
(Plastic Package)

ORDER CODE : TDA1170N

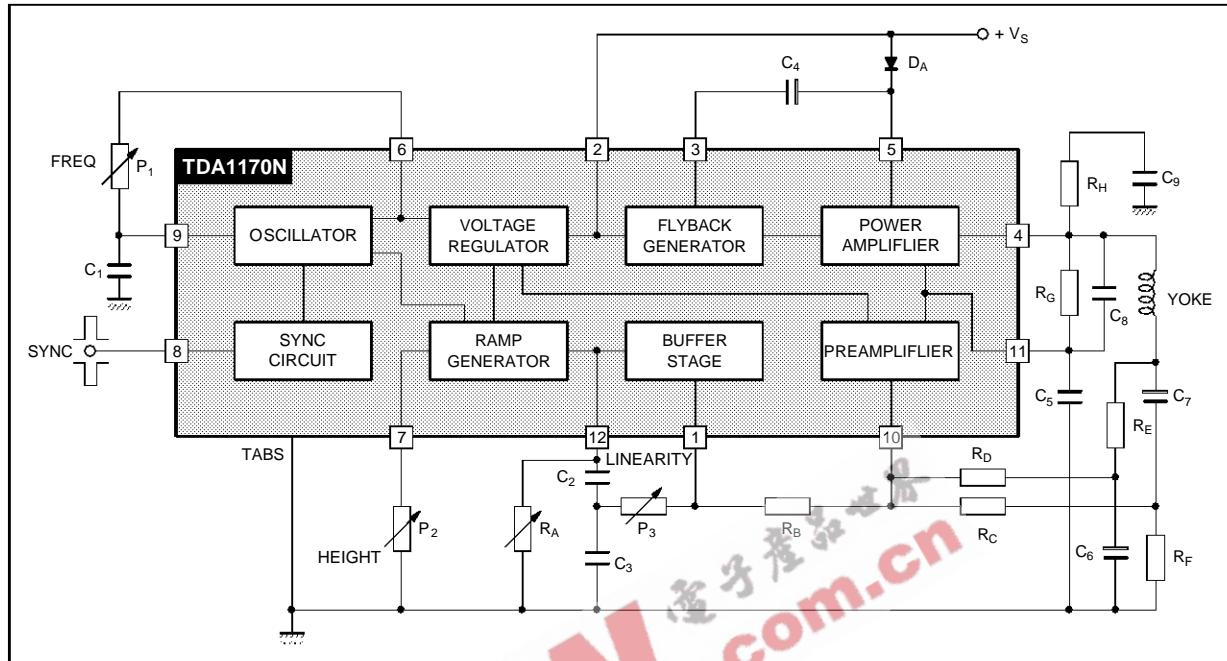
PIN CONNECTIONS



1170N-01.EPS

TDA1170N

BLOCK DIAGRAM



1170N-02.EPS

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _S	Supply Voltage at Pin 2	35	V
V ₄ , V ₅	Flyback Peak Voltage	60	V
V ₁₀	Power Amplifier Input Voltage	+ 10 - 0.5	V
I _o	Output Peak Current (non repetitive) at t = 2msec	2	A
I _o	Output Peak Current at f = 50Hz t ≤ 10μsec	2.5	A
I _o	Output Peak Current at f = 50Hz t > 10μsec	1.5	A
I ₃	Pin 3 DC Current at V ₄ < V ₂	100	mA
I ₃	Pin 3 Peak to Peak Flyback Current for f = 50Hz, t _{fly} ≤ 1.5msec	1.8	A
I ₈	Pin 8 Current	± 20	mA
P _{tot}	Power Dissipation : at T _{ab} = 90°C at T _{amb} = 80°C (free air)	5 1	W W
T _{stg} , T _j	Storage and Junction Temperature	- 40, +150	°C

1170N-01.TBL

THERMAL DATA

Symbol	Parameter	Value	Unit
R _{th} j-tab	Thermal Resistance Junction-tab	Max	12 °C/W
R _{th} j-amb	Thermal Resistance Junction-ambient	Max	70 °C/W *

* Obtained with tabs soldered to printed circuit with minimized copper area.

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

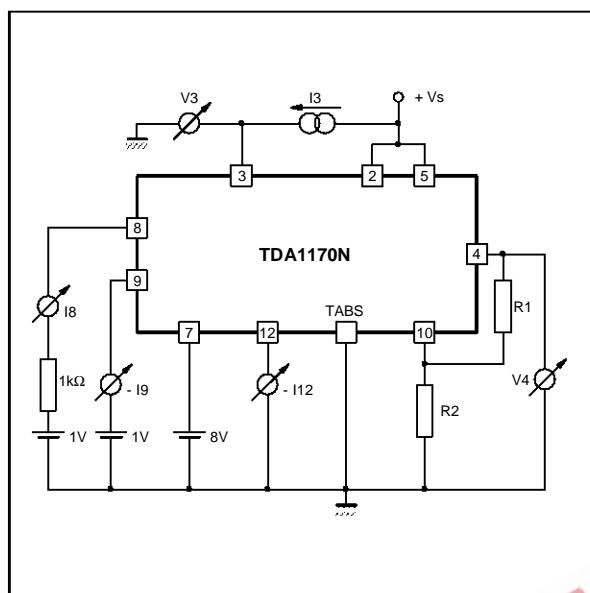
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit	Fig.	
I_2	Pin 2 Quiescent Current	$I_3 = 0$		7	14	mA	1b	
I_5	Pin 5 Quiescent Current	$I_4 = 0$		8	17	mA	1b	
$-I_9$	Oscillator Bias Current	$V_9 = 1\text{V}$		0.1	1	μA	1a	
$-I_{10}$	Amplifier Input Bias Current	$V_{10} = 1\text{V}$		1	10	μA	1b	
$-I_{12}$	Ramp Generator Bias Current	$V_{12} = 0$		0.02	0.3	μA	1a	
$-I_{12}$	Ramp Generator Current	$I_7 = 20\mu\text{A}, V_{12} = 0$	18.5	20	21.5	μA	1b	
$\frac{\Delta I_{12}}{I_{12}}$	Ramp Generator Non-linearity	$\Delta V_{12} = 0 \text{ to } 12\text{V}, I_7 = 20\mu\text{A}$		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	$I_3 = 10\text{mA}$		300	450	mV	1a	
V_4	Quiescent output Voltage	$V_s = 10\text{V}$ $R_1 = 1\text{k}\Omega, R_2 = 1\text{k}\Omega$	4.1	4.4	4.75	V	1a	
		$V_s = 35\text{V}$ $R_1 = 3\text{k}\Omega, R_2 = 1\text{k}\Omega$	8.3	8.8	9.45	V	1a	
V_{4L}	Output Saturation Voltage to Ground	$-I_4 = 0.1\text{A}$ $-I_4 = 0.8\text{A}$		0.9 1.9	1.2 2.3	V V	1c 1c	
V_{4H}	Output Saturation Voltage to Supply	$I_4 = 0.1\text{A}$ $I_4 = 0.8\text{A}$		1.4 2.8	2.1 3.2	V V	1d 1d	
V_6	Regulated Voltage at Pin 6		6.1	6.5	6.9	V	1b	
V_7	Regulated Voltage at Pin 7	$I_7 = 20\mu\text{A}$	6.2	6.6	7	V	1b	
$\frac{ \Delta V_6 }{\Delta V_s}, \frac{\Delta V_7}{\Delta V_s}$	Regulated Voltage Drift with Supply Voltage	$\Delta V_s = 10 \text{ to } 35\text{V}$		1		mV/V	1b	
V_{10}	Amplifier Input Reference Voltage			2.07	2.2	2.3	V	
R_8	Pin 8 Input Resistance	$V_8 \leq 0.4\text{V}$	1			M Ω	1a	

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TDA1170N

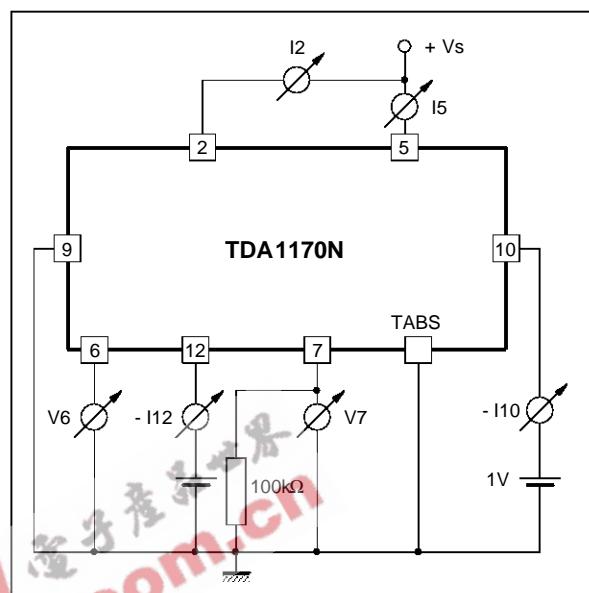
Figure 1 : DC Test Circuits

Figure 1a



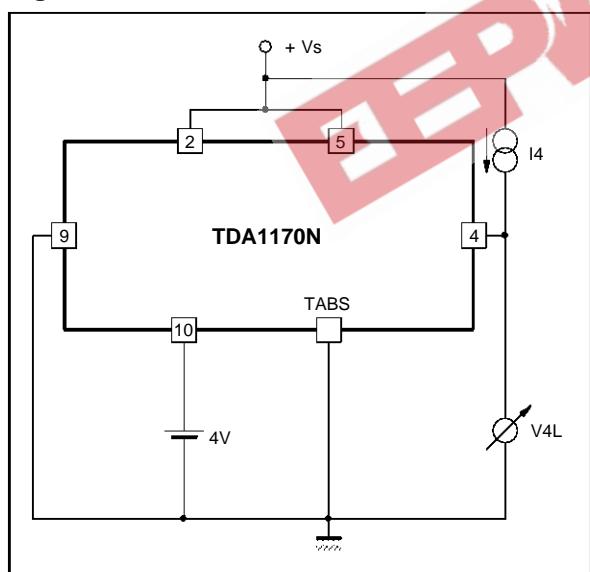
1170N-03.EPS

Figure 1b



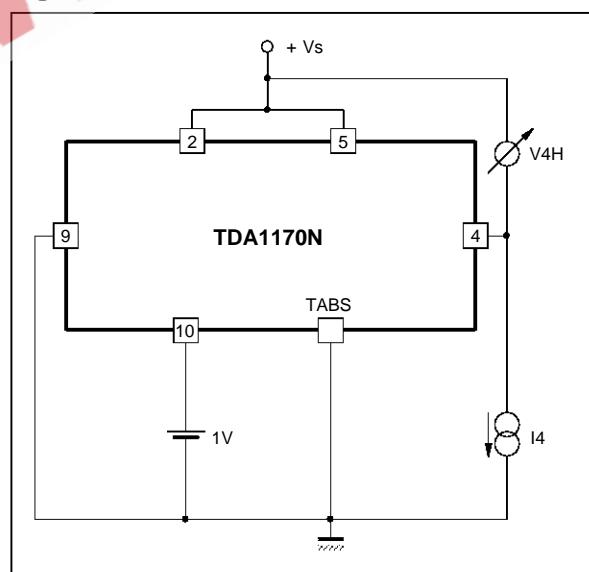
1170N-04.EPS

Figure 1c



1170N-05.EPS

Figure 1d

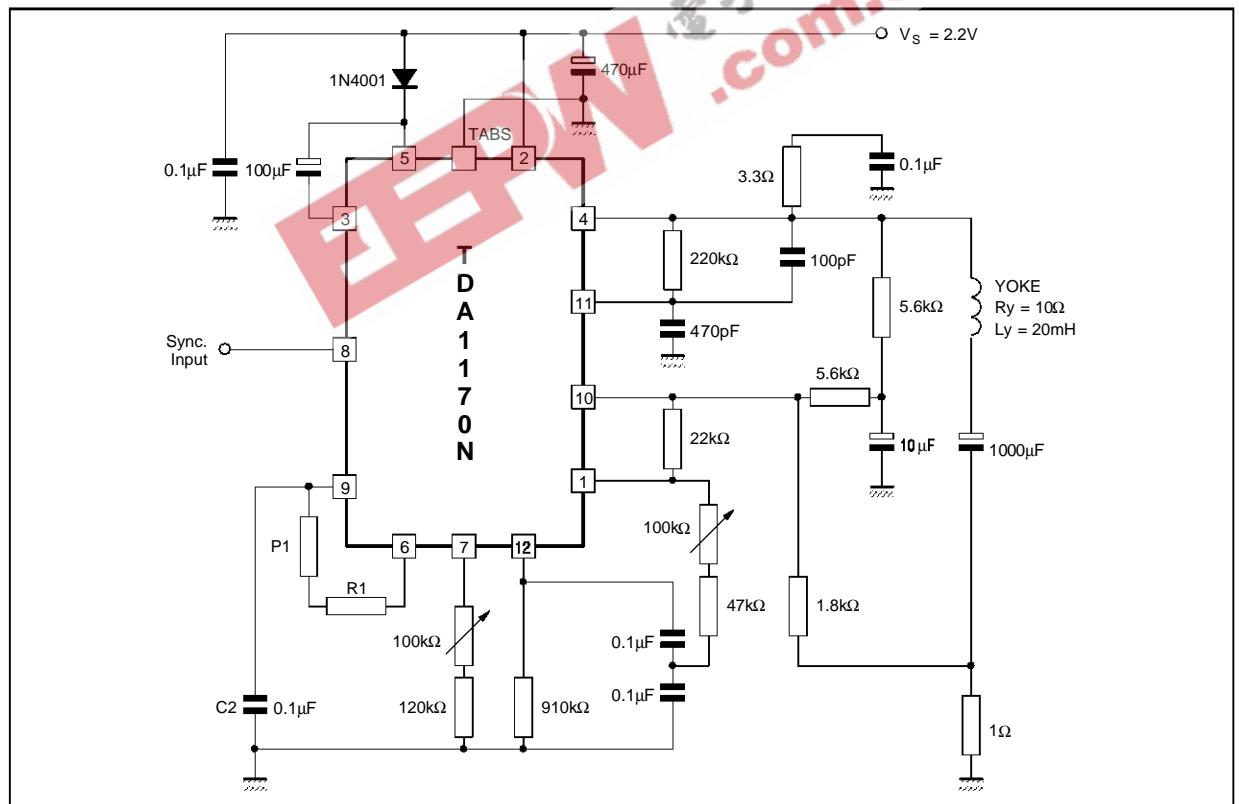


1170N-06.EPS

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	$I_y = 1App$		140		mA
I_8	Sync. Input Current (positive or negative)		500			µA
V_4	Flyback Voltage	$I_y = 1App$		45		V
t_{fly}	Flyback Time	$I_y = 1App$		0.7		ms
V_{ON}	Peak to Peak Output Noise	Pin 9 Connected to GND			40	mV _{PP}
f_o	Free Running Frequency	$(P1 + R1) = 300k\Omega$, $C2 = 0.1\mu F$ $(P1 + R1) = 260k\Omega$, $C2 = 0.1\mu F$		42.2 48.5		Hz Hz
Δf	Sychronization Range	$I_8 = 0.5mA$	14			Hz
$\frac{\Delta f}{\Delta V_S}$	Frequency Drift with Supply Voltage	$V_S = 10$ to $35V$		0.005		Hz/V
$\frac{ \Delta f }{\Delta T_{ab}}$	Frequency Drift with tab Temperature	$T_{tab} = 40$ to $120^\circ C$		0.01		Hz/°C

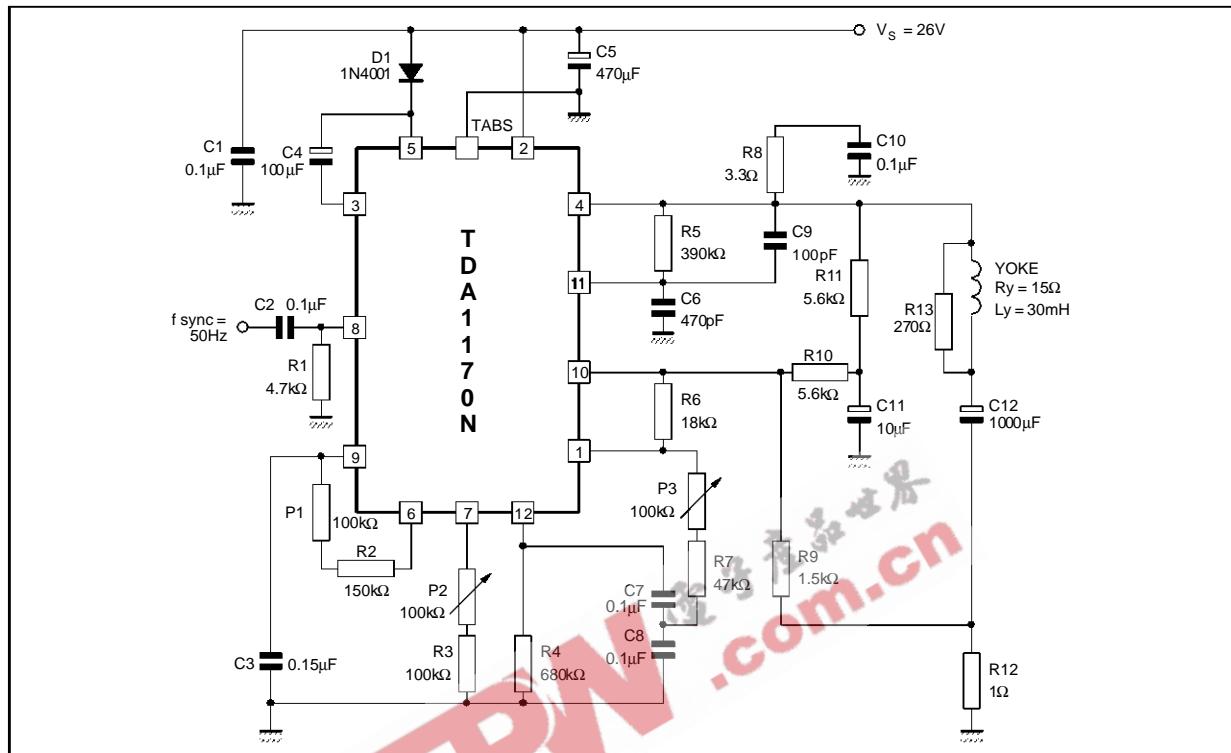
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Figure 2 : AC Test and Application Circuit for Large Screen B/W TV Set 10Ω/20mH/1App

1170N-07-EP.S

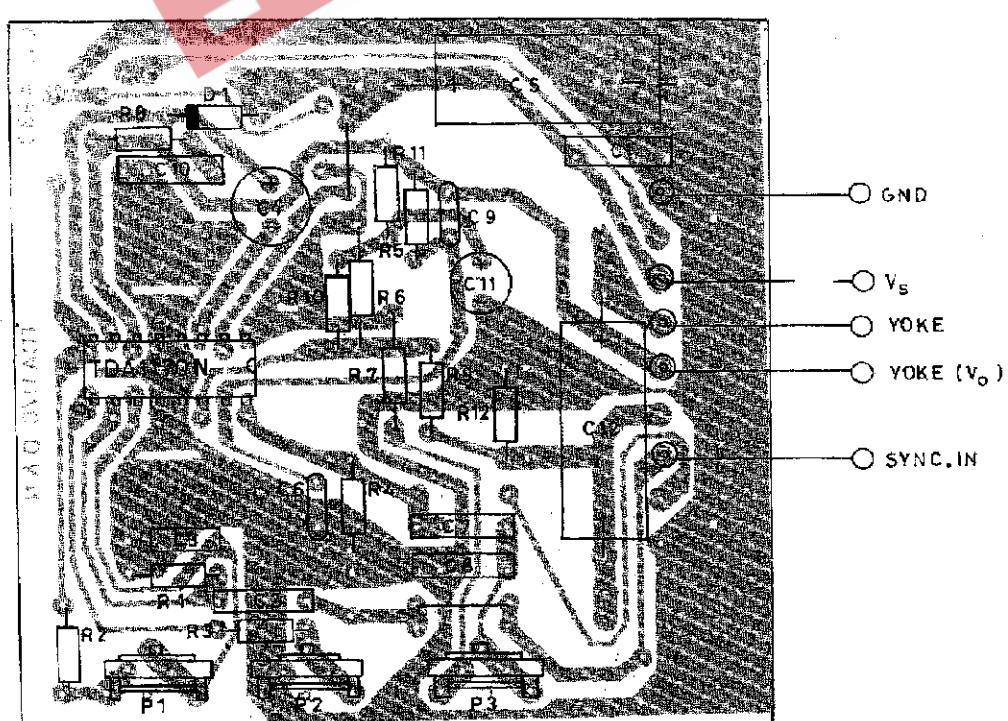
TDA1170N

Figure 3 : Typical Application Circuit for Small Screen 90°TVC Set ($R_Y = 15\Omega$, $L_Y = 30mH$, $I_Y = 0.82$ App)



1170N-08.EPS

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



1170N-09.TIF

MOUNTING INSTRUCTION

During soldering the tab 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.

The junction to ambient thermal resistance can be

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

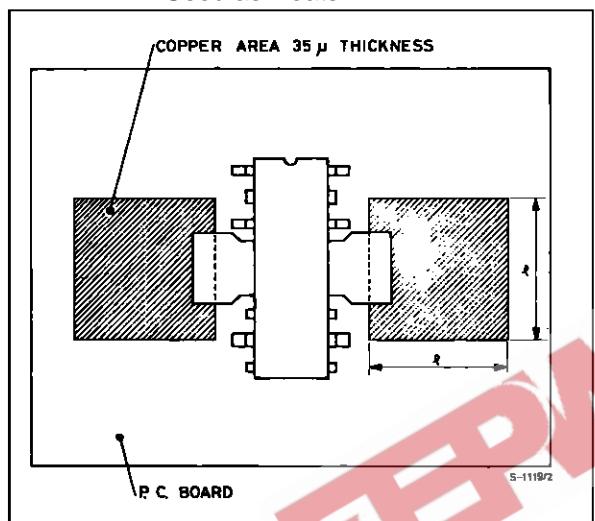
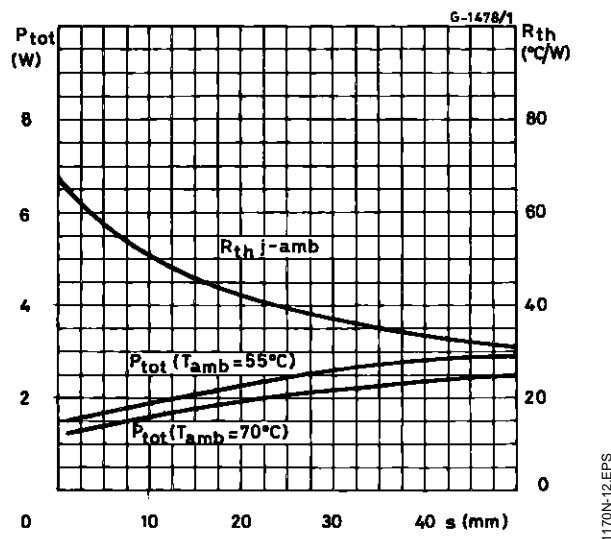


Figure 7 : Maximum Power Dissipation and Junction-Ambient Thermal Resistance versus "e"



reduced by soldering the tabs to a suitable copper area of the printed circuit board (fig. 5) or to an external heatsink (fig. 6).

The diagram of fig. 7 shows the maximum dissipable power P_{tot} and the $R_{\text{th j-amb}}$ as a function of the side "e" of two equal square copper areas having a thickness of 35 μ (1.4 mil).

Figure 6 : Example of External heatsink

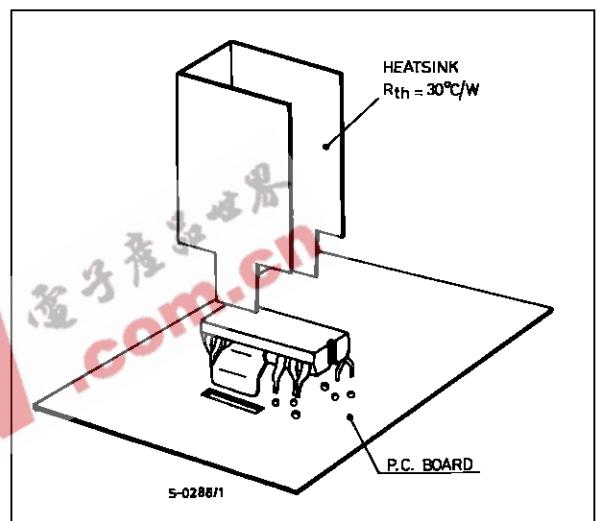
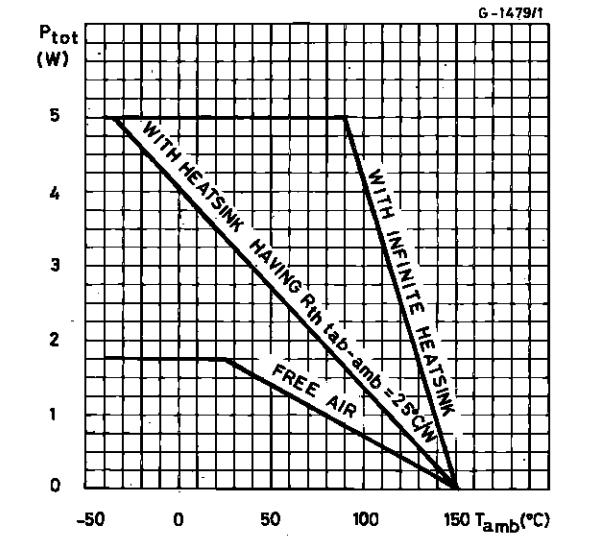
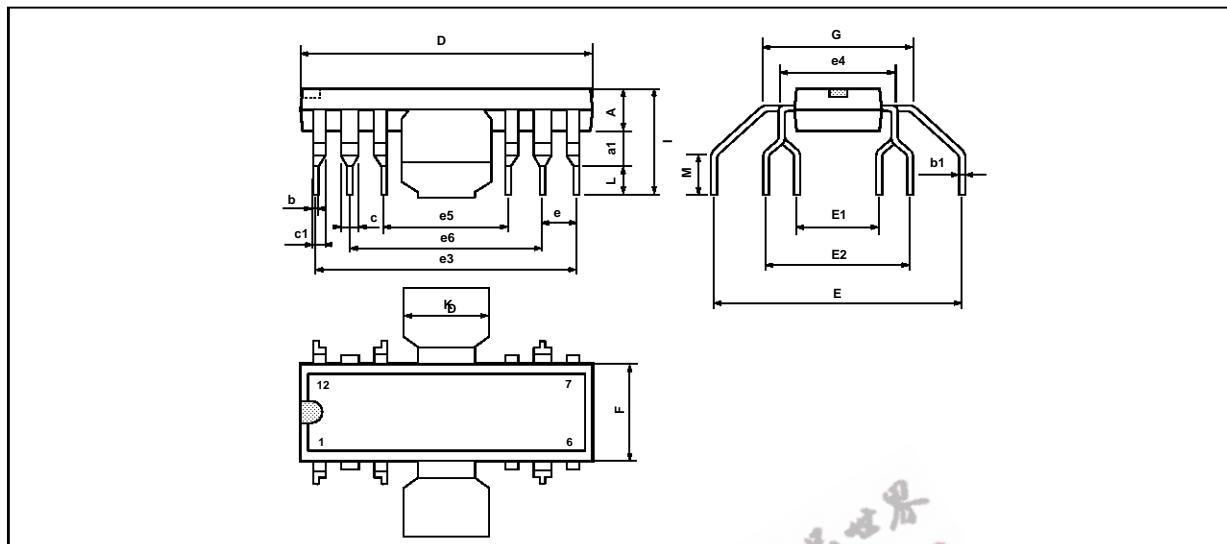


Figure 8 : Maximum Allowable Power Dissipation versus Ambient Temperature



TDA1170N

PACKAGE MECHANICAL DATA : 12 PINS - PLASTIC FNDIP



FNDIP.TBL

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	3.8		4.05	0.150		0.159
a1	1.5		1.75	0.059		0.069
b	0.55		0.6	0.022		0.024
b1	0.3		0.35	0.012		0.014
c		1.32			0.052	
c1		0.94			0.037	
D	19.2		19.9	0.756		0.783
E	16.8	17.2	17.6	0.661	0.677	0.693
E1	4.86		5.56	0.191		0.219
E2	10.11		10.81	0.398		0.426
e	2.29	2.54	2.79	0.090	0.100	0.110
e3	17.43	17.78	18.13	0.686	0.700	0.714
e4		7.62			0.300	
e5	7.27	7.62	7.97	0.286	0.300	0.314
e6	12.35	12.7	13.05	0.486	0.500	0.514
F	6.3		7.1	0.248		0.280
G		9.8			0.386	
I	7.8		8.6	0.307		0.339
K	6.1		6.5	0.240		0.256
L	2.5		2.9	0.098		0.114
M	2.5		3.1	0.098		

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