SGS **TDA1470**

LINEAR INTEGRATED CIRCUIT

TV VERTICAL DEFLECTION SYSTEM

The TDA 1470 is a monolitic integrated circuit in a 16-lead dual in-line plastic package with or without external bar. It is intended for direct driving of colour TV yokes, but it offers a wide application range also in BW TVs, monitors and displays.
The functions incorporated are:

- Synchronization circuit
- Oscillator and ramp generator
- Power amplifier with high current capability
- Flyback generator
- Voltage regulator

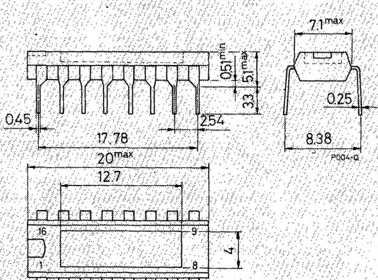
ABSOLUTE MAXIMUM RATINGS

V_s	Supply voltage at pin 3	35	V
V_{14}, V_{16}	Flyback peak voltage	60	V
V_7, V_8	Power amplifier input voltage	+10	V
		-0.5	V
I_o	Output peak current (non repetitive) at $t = 2$ ms	3	A
I_o	Output peak current at $f = 50$ Hz, $t \leq 10\ \mu s$	3.5	A
I_o	Output peak current at $f = 50$ Hz, $t > 10\ \mu s$	2	A
I_2	Pin 2 D.C. current at $V_{16} < V_3$	100	mA
I_2	Pin 2 peak to peak flyback current for $f = 50$ Hz, $t_{fly} \leq 1.5$ ms	3	A
I_{11}	Pin 11 current	20	mA
P_{tot}	Maximum power dissipation at $T_{case} \leq 75°C$	25	W
T_{stg}, T_j	Storage and junction temperature	-40 to 150	°C

ORDERING NUMBER: TDA 1470

MECHANICAL DATA

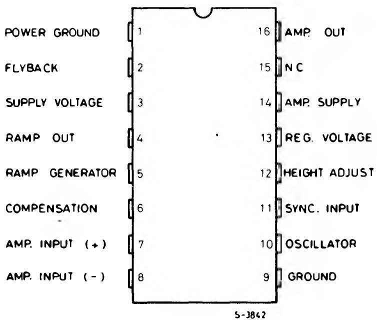
Dimensions in mm

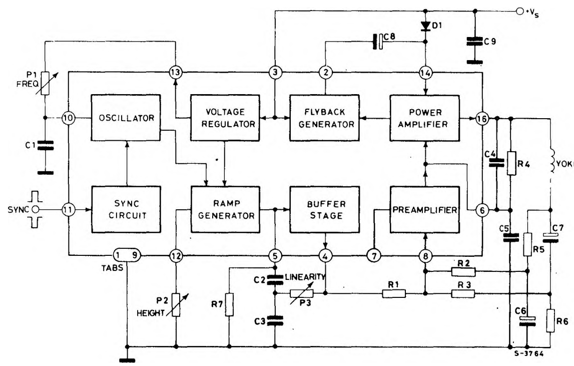


TDA1470

CONNECTION AND BLOCK DIAGRAMS

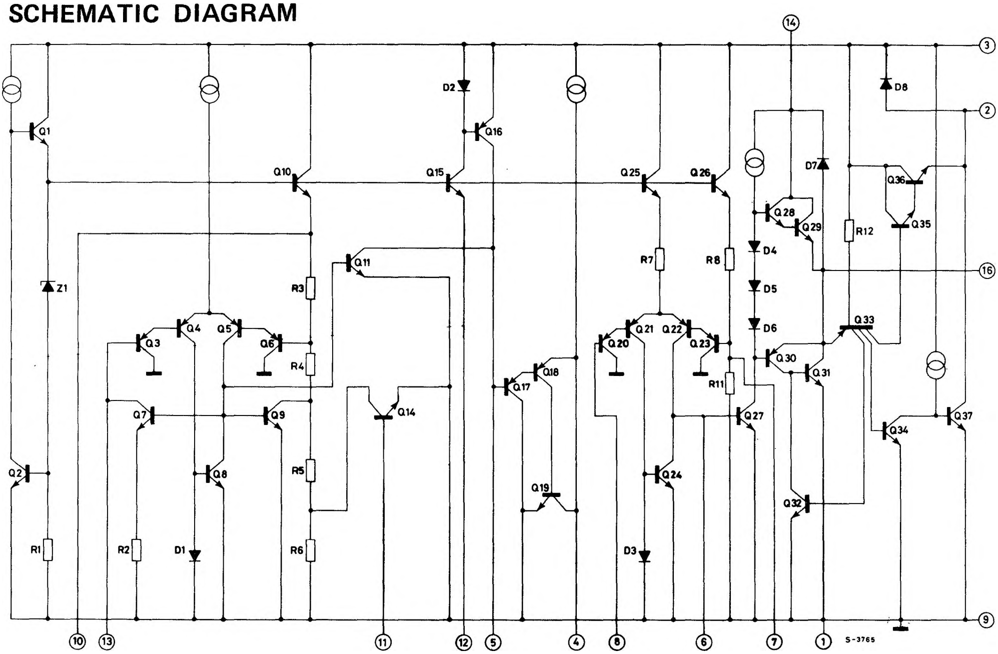
(top view)





The copper slug is electrically connected to pin 9 (substrate)

SCHEMATIC DIAGRAM



THERMAL DATA

$R_{th\ j\text{-}case}$	Thermal resistance junction-case	max	3	°C/W

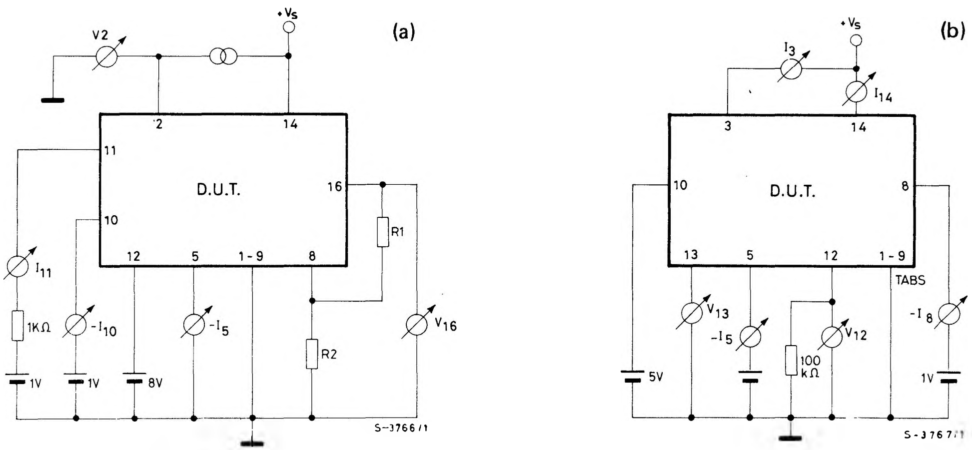
DC ELECTRICAL CHARACTERISTICS (Refer to the DC test circuits, $V_s = 35V$, $T_{amb} = 25°C$, unless otherwise specified)

	Parameter	Test conditions	Min.	Typ.	Max.	Unit	Fig.
I_3	Pin 3 quiescent current	$I_2 = 0$		7		mA	1b
I_{14}	Pin 14 quiescent current	$I_{16} = 0$		10		mA	1b
$-I_{10}$	Oscillator bias current	$V_{10} = 1V$		0.1		μA	1a
$-I_8$	Amplifier input bias current	$V_8 = 1V$		1		μA	1b
$-I_5$	Ramp generator bias current	$V_5 = 0V$		0.02		μA	1a
$-I_5$	Ramp generator current	$V_5 = 0V$ $I_{12} = 20\ \mu A$		20		μA	1b
$\frac{\Delta I_5}{I_5}$	Ramp generator linearity	$\Delta V_5 = 0$ to $12V$ $I_{12} = 20\ \mu A$		0.2	1	%	1b
V_s	Supply voltage range(pin 3)		10		35	V	—
V_4	Pin 4 saturation voltage to ground	$I_4 = 1\ mA$		1	1.4	V	—
V_2	Pin 2 saturation voltage to ground	$I_2 = 10\ mA$		0.5		V	1a
V_{16}	Quiescent output voltage	$V_s = 10V$ $R_1 = 10K\Omega$ $R_2 = 10\ K\Omega$	4.15	4.45	4.73	V	1a
		$V_s = 35V$ $R_1 = 30\ K\Omega$ $R_2 = 10\ K\Omega$	8.3	8.9	9.45	V	1a
V_{16L}	Output saturation voltage to ground	$-I_{16} = 0.8A$		1.3		V	1c
		$-I_{16} = 1.5A$		1.7		V	1c

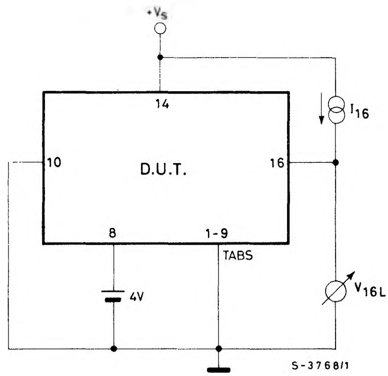
D.C. ELECTRICAL CHARACTERISTICS (continued)

Parameter		Test conditions	Min.	Typ.	Max.	Unit	Fig.
V_{16H}	Output saturation voltage to supply	I_{16}= 0.8A		1.9		V	1d
		I_{16}= 1.5A		2.3		V	1d
V_{13}	Regulated voltage at pin 13		6.1	6.5	6.9	V	1b
V_{12}	Regulated voltage at pin 12	I_{12}= 20 μA	6.2	6.5	7	V	1b
$\frac{\Delta V_{13}}{\Delta V_s}$; $\frac{\Delta V_{12}}{\Delta V_s}$	Regulated voltages drift	ΔV_s= 10 to 35V		1		mV/V	1b
V_7	Amplifier input reference voltage		2.07	2.2	2.3	V	

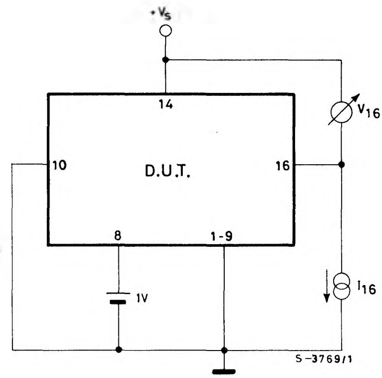
Fig. 1 - DC test circuits



(c)



(d)



AC ELECTRICAL CHARACTERISTICS (Refer to the AC test circuit f = 50 Hz, V_s = 24V, unless otherwise specified)

	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V_s	Operating supply voltage	$I_{y\ max}$ = 2.2 App		24		V
I_s	Supply current	I_y = 2 App		270		mA
I_{11}	Sync. input current		500			μA
V_{16}	Flyback voltage	I_y = 2 App		49		V
V_{10}	Peak to peak oscillator sawtooth voltage			2.4		V
t_{fly}	Flyback time	I_y = 2 App		0.6		ms
f_o	Free running frequency	R_1+P_1 = 300 KΩ C_2 = 100 nF		44		Hz
		R_1+P_1 = 260 KΩ C_2 = 100 nF		52		Hz
Δf	Synchronization range	I_{11} = 500 μA	14			Hz
$\frac{\Delta f}{\Delta V_s}$	Frequency drift vs. supply voltage	V_s = 10 to 35V		0.005		Hz/V
$\frac{\Delta f}{\Delta T_{tab}}$	Frequency drift vs. tab temperature	T_{amb} = 40 to 120 °C		0.01		Hz/°C

Fig. 2 - AC Test circuit

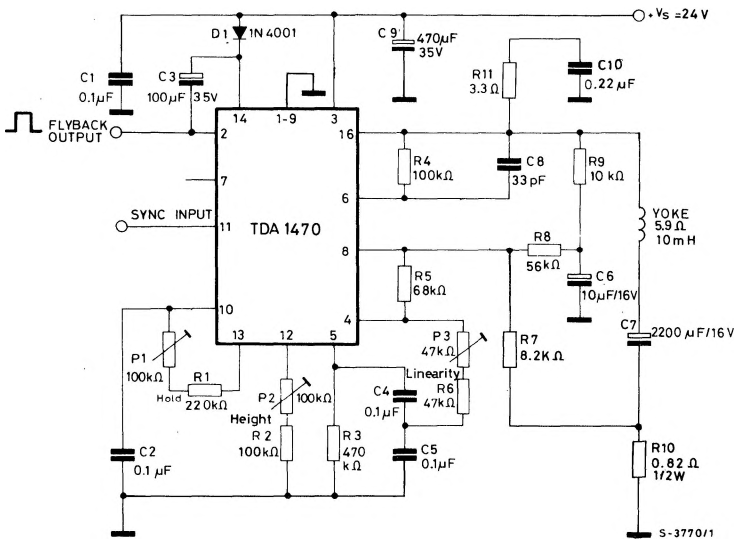


Fig. 3 - Relative output voltage drift vs. supply voltage

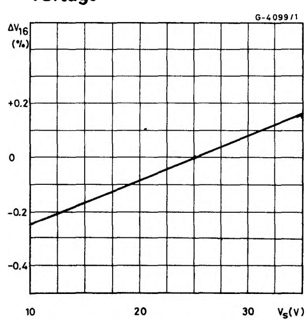


Fig. 4 - Relative output voltage drift vs. case temperature

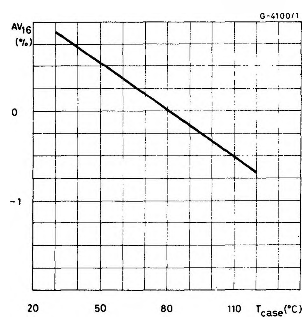


Fig. 5 - Output saturation voltage vs. output current

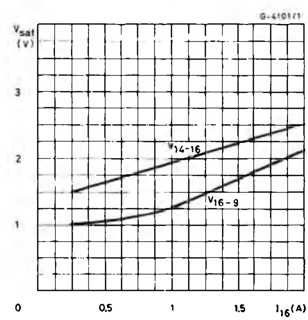
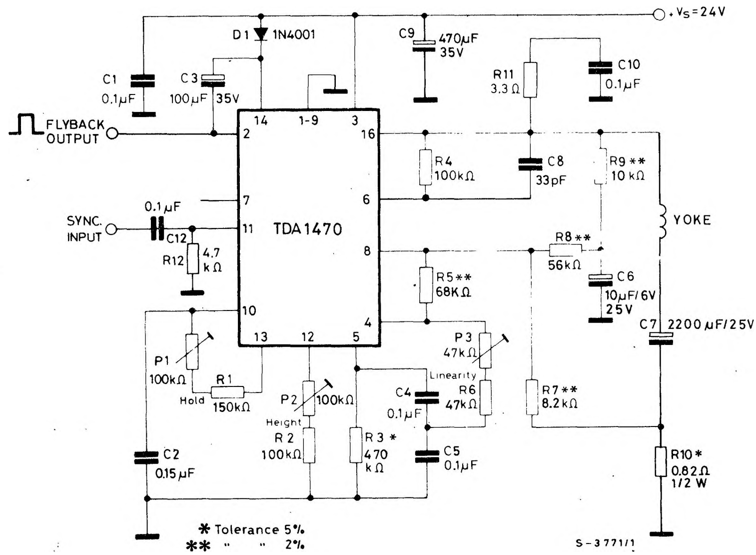


Fig. 6 - Application circuit for large screen 110° TVC set (R_y= 5.9Ω; L_y= 10 mH; I_y= 1.95 App)

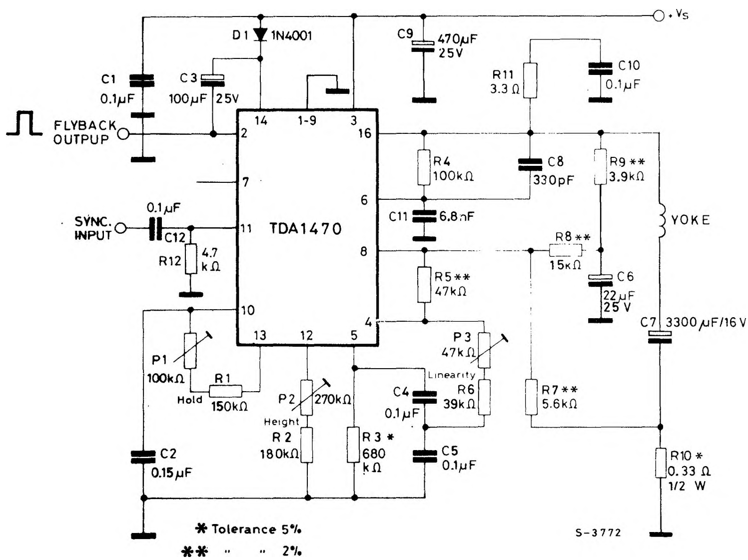


Typical performance

V_s.	Operating supply voltage	24	V
I_s	Supply current	300	mA
t_{fly}	Flyback time	0.7	ms
P_d	TDA 1470 power dissipation	4	W
I_y	Maximum scanning current	2.3	App

For safe operation up to T_{amb}= 60°C a heatsink of R_{th}= 7°C/W is required.

Fig. 7 - Application circuit for PIL 26" -110° parallel connected (R_y = 2.5Ω; L_y = 6.6 mH; I_y = 2.36 App)

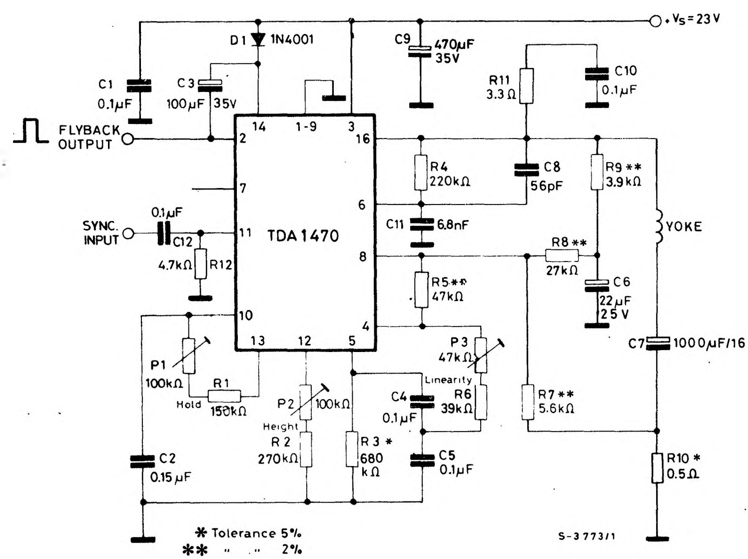


Typical performance

V_s	Operating supply voltage	16	V
I_s	Supply current	345	mA
t_{fly}	Flyback time	0.85	ms
P_d	TDA 1470 power dissipation	3.5	W
I_y	Maximum scanning current	2.5	App

For safe operation up to T_{amb} = 60°C a heatsink of R_{th} = 8 °C/W is required.

Fig. 8 - Application circuit for PIL 26" -110° series connected ($R_y = 9.7\Omega$; $L_y = 26.4$ mH; $I_y = 1.18$ App)

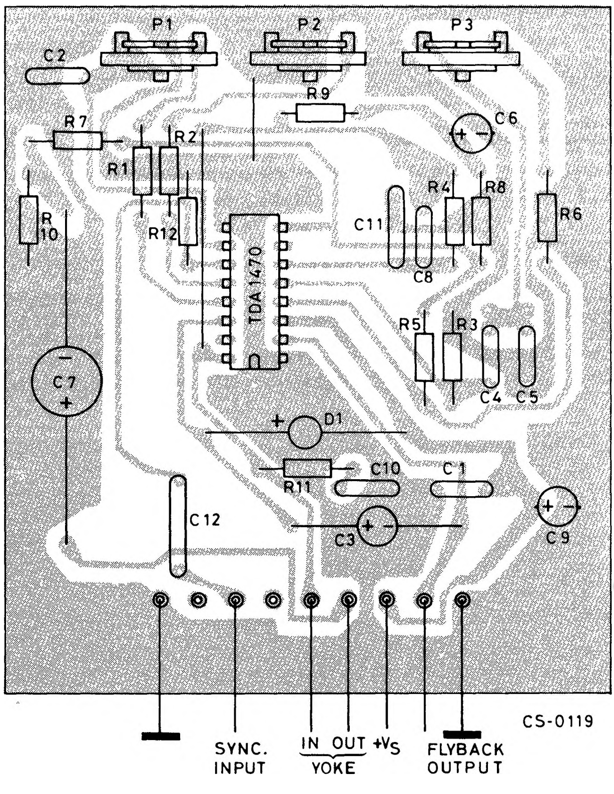


Typical performance

V_s	Operating supply voltage	23	V
I_s	Supply current	185	mA
t_{fly}	Flyback time	1	ms
P_d	TDA 1470 power dissipation	2.8	W
I_y	Maximum scanning current	1.4	App

For safe operation up to $T_{amb} = 60°C$ a heatsink of $R_{th} = 10$ °C/W is required.

Fig. 9 - P.C. board and component layout (Application circuits of fig. 6, 7 and 8)



MOUNTING INSTRUCTIONS

The power dissipated in the circuit must be removed by adding an external heatsink as shown in fig. 10. The system for attaching the heatsink is very simple; it uses a plastic spacer which is supplied with the device on request (TDA 1470 F2).

Thermal contact between the copper slug (of the package) and the heatsink is guaranteed by the pressure which the screws exert via the printed circuit board, this is due to the particular shape of the spacer.

Note: The most negative supply voltage is connected to the copper slug, hence to the heatsink (because it is in contact with the slug).

Fig. 10 - Mounting system example (TDA 1470)