LINEAR INTEGRATED CIRCUITS

TDA8170

ADVANCE DATA

TV VERTICAL DEFLECTION OUTPUT CIRCUIT

The TDA 8170 is a monolithic integrated circuit in HEPTAWATT™ package. It is a high efficiency power booster for direct driving of vertical windings of TV yokes. It is intended for use in Colour and B & W television receivers as well as in monitors and displays. The functions incorporated are:

- power amplifier
- flyback generator
- reference voltage
- thermal protection

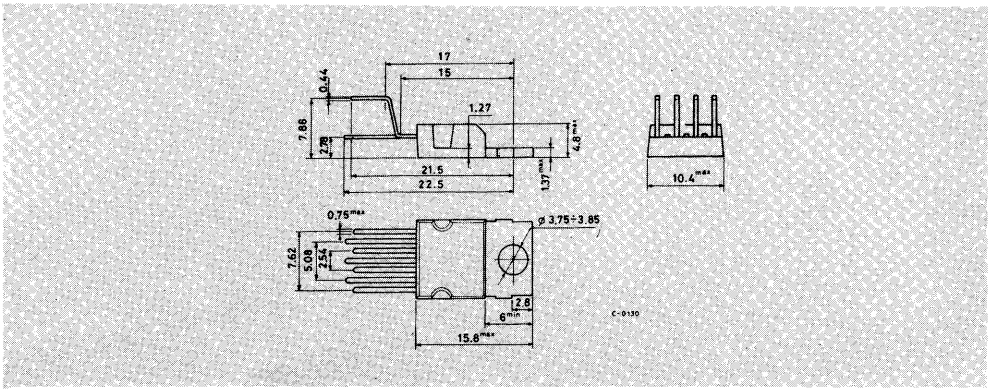
ABSOLUTE MAXIMUM RATINGS

V_s	Supply voltage (pin 2)	35	V
V_5, V_6	Flyback peak voltage	60	V
V_3	Voltage at pin 3	$+ V_s$	
V_1, V_7	Amplifier input voltage	$+ V_s$	
I_o	Output peak current (non repetitive, t = 2 msec)	-0.5 2.5	V A
I_o	Output peak current at f = 50 or 60 Hz, $t \leq 10\ \mu sec$	3	A
I_o	Output peak current at f = 50 or 60 Hz, $t > 10\ \mu sec$	2	A
I_3	Pin 3 DC current at $V_5 < V_2$	100	mA
I_3	Pin 3 peak to peak flyback current at f = 50 or 60 Hz, $t_{fly} \leq 1.5$ msec	3	A
P_{tot}	Total power dissipation at $T_{case} = 70°C$	20	W
T_{stg}, T_j	Storage and junction temperature	-40 to 150	°C

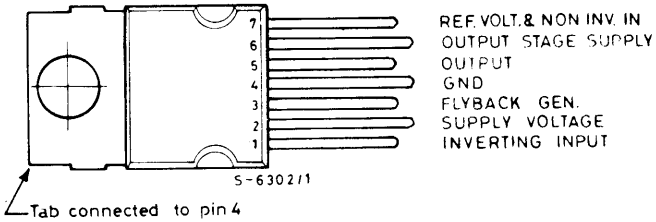
ORDERING NUMBER: TDA 8170

MECHANICAL DATA

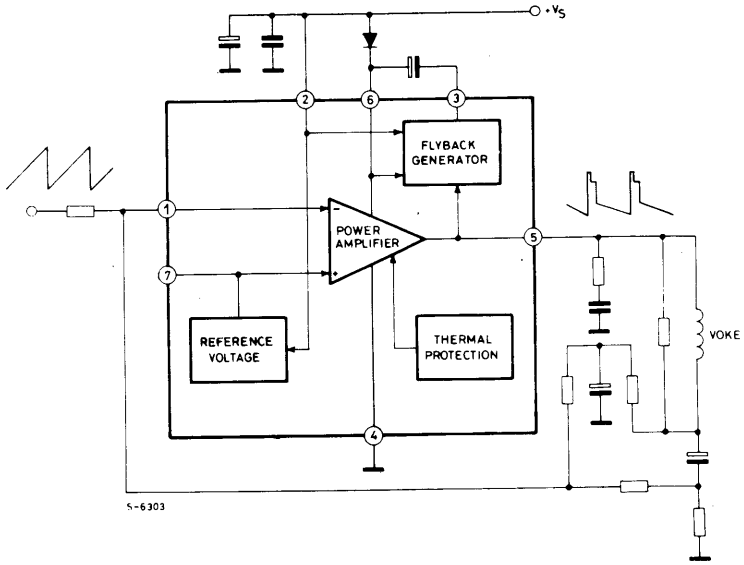
Dimensions in mm



CONNECTION DIAGRAM
(top view)



BLOCK DIAGRAM



SCHEMATIC DIAGRAM

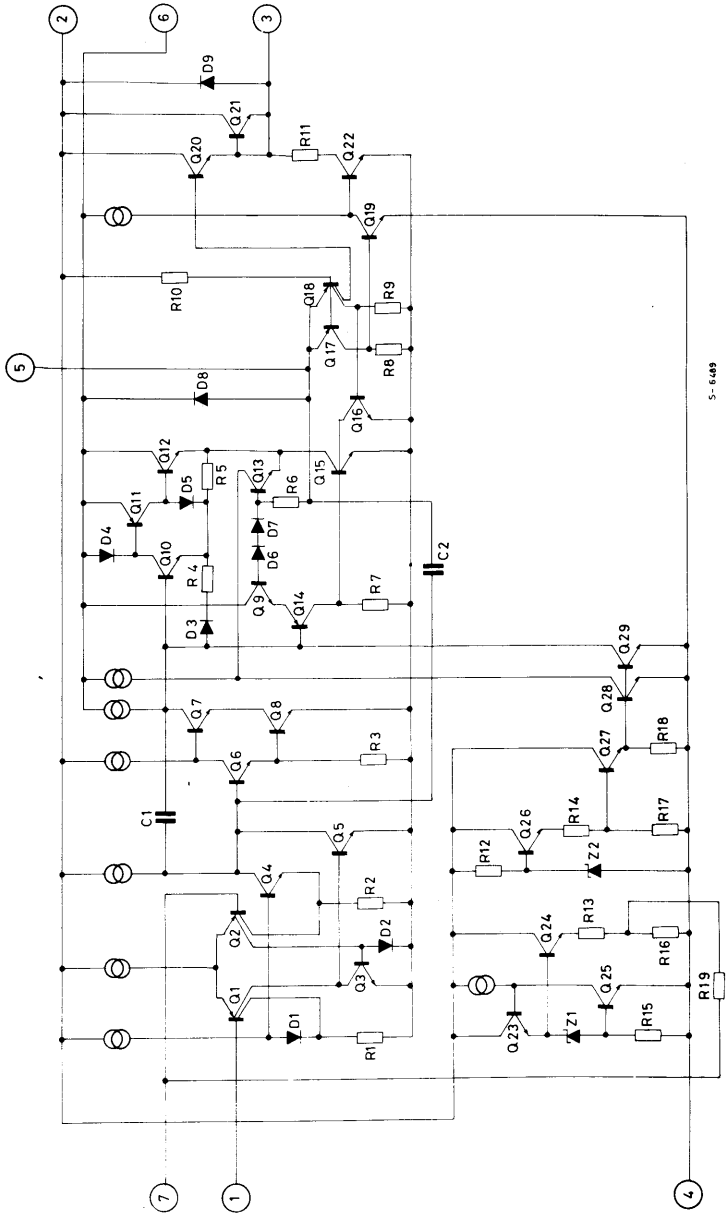
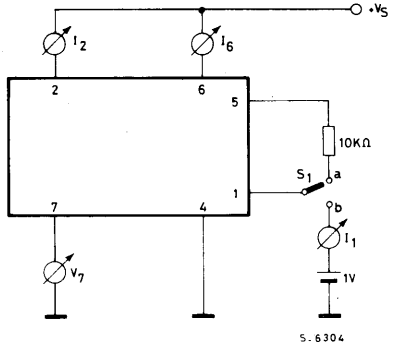


Fig. 1 - DC test circuits

Fig. 1a - Measurement of I_1; I_2; I_6; V_7; $\Delta V_7/\Delta V_s$.



S_1 : (a) I_2 and I_6; (b) I_1

Fig. 1b - Measurement of V_{5H}

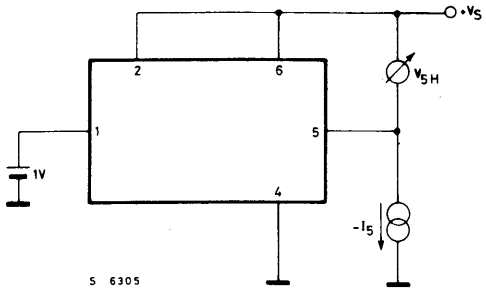
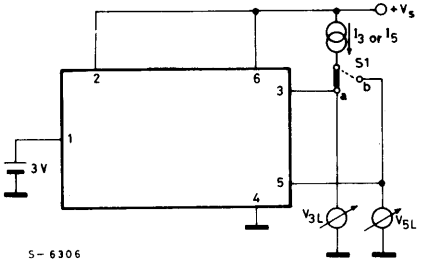
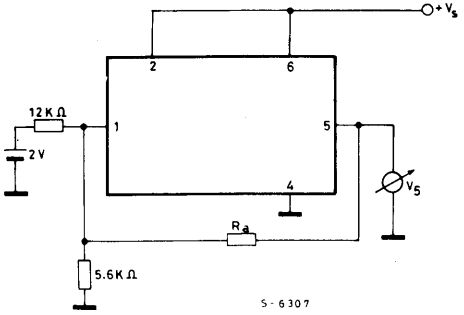


Fig. 1c - Measurement of V_{3L}; V_{5L}



S1 : (a) V_{3L}; (b) V_{5L}.

Fig. 1d - Measurement of V_5



THERMAL DATA

$R_{th\ j\text{-}case}$	Thermal resistance junction-case	max	4	°C/W

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

Parameter		Test conditions	Min.	Typ.	Max.	Unit	Fig.
I_2	Pin 2 quiescent current	$I_3 = 0$ $I_5 = 0$		8	16	mA	1a
I_6	Pin 6 quiescent current	$I_3 = 0$ $I_5 = 0$		16	36	mA	1a
I_1	Amplifier input bias current	V_1 = 1V		-0.1	-1	μA	1a
V_7	Reference voltage			2.2		V	1a
$\frac{\Delta V_7}{\Delta V_s}$	Reference voltage drift vs. supply voltage	V_s = 15 to 30V		1	2	mV/V	1a
V_{3L}	Pin 3 saturation voltage to GND	I_3 = 20 mA		1		V	1c
V_5	Quiescent output voltage	V_s = 35V; R_a = 39 KΩ		18		V	1d
		V_s = 15V; R_a = 13 KΩ		7.5		V	1d
V_{5L}	Output saturation voltage to GND	I_5 = 1.2A		1	1.4	V	1c
		I_5 = 0.7A		0.7	1	V	1c
V_{5H}	Output saturation voltage to supply	$-I_5$ = 1.2A		1.6	2.2	V	1b
		$-I_5$ = 0.7A		1.3	1.8	V	1b
T_j	Junction temperature for thermal shut down			140		°C	

Fig. 2 - AC test circuit

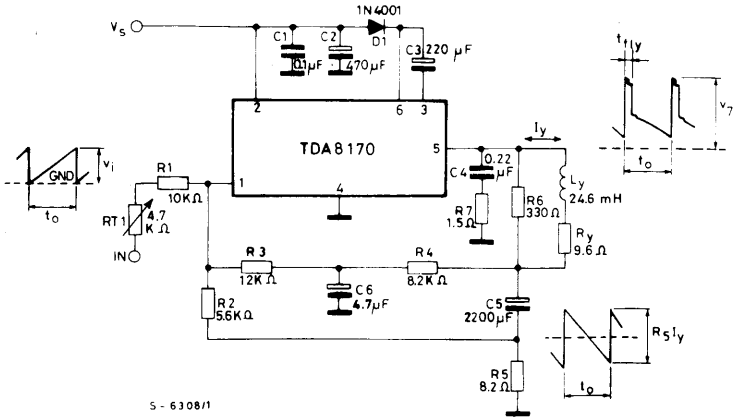
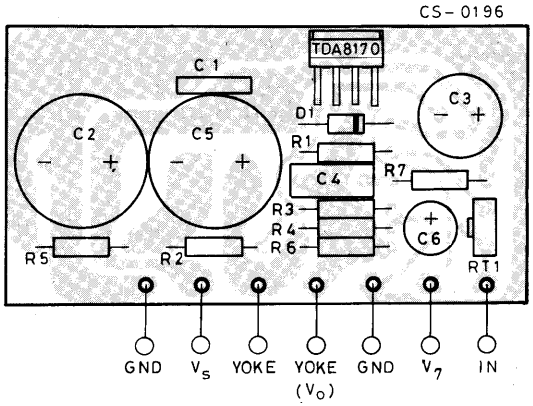


Fig. 3 - PC board and component layout of the circuit of fig. 2 (1:1 scale)



Components list for typical applications

Component	110° TVC 5.9Ω/10 mH 1.95 App	110° TVC 9.6Ω/24.6 mH 1.2 App	90° TVC 15Ω/30 mH 0.82 App	Unit
RT1	10	4.7	10	KΩ
R1	12	10	12	KΩ
R2	10	5.6	5.6	KΩ
R3	27	12	18	KΩ
R4	12	8.2	5.6	KΩ
R5	0.82	1	1	Ω
R6	270	330	330	Ω
R7	1.5	1.5	1.5	Ω
D1	1N 4001	1N 4001	1N 4001	–
C1	0.1	0.1	0.1	μF
C2 el.	1000/25V	470/25V	470/25V	μF
C3 el.	220/25V	220/25V	220/25V	μF
C4	0.22	0.22	0.22	μF
C5 el.	2200/25V	2200/25V	1000/16V	μF
C6 el.	4.7/16V	4.7/16V	10/16V	μF

Typical performances

Parameter	110° TVC 5.9Ω/10 mH	110° TVC 9.6Ω/27 mH	90° TVC 15Ω/30 mH	Unit
V_s – Supply voltage	24	22.5	25	V
I_s – Current	280	175	125	mA
t_{fly} – Flyback time	0.6	1	0.7	ms
P_{tot} – Power dissip.	4.2	2.5	2.05	W
$R_{th\ c-a}$ – Heatsink	7	13	16	°C/W
T_{amb}	60	60	60	°C
$T_{j\ max}$	110	110	110	°C
t_o	20	20	20	ms
v_i	2.5	2.5	2.5	Vpp
v_7	2.5	2.5	2.5	Vp

Fig. 4 - Complete deflection circuit