



TDA2170

LINEAR INTEGRATED CIRCUITS

PRELIMINARY DATA

TV VERTICAL DEFLECTION OUTPUT CIRCUIT

The TDA 2170 is a monolithic integrated circuit in 11-lead Multiwatt[®] 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

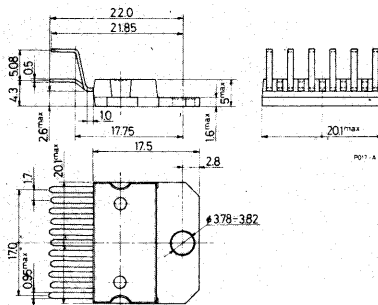
ABSOLUTE MAXIMUM RATINGS

V_s	Supply voltage (pin 4)	35	V
V_7, V_8	Flyback peak voltage	60	V
V_5	Voltage at pin 5	+ V_s	
V_2, V_3	Amplifier input voltage	+ V_s	
I_o	Output peak current (non repetitive, $t = 2$ msec)	-0.5	V
I_o	Output peak current at $f = 50$ Hz, $t \leq 10$ μ sec	2.5	A
I_o	Output peak current at $f = 50$ Hz, $t > 10$ μ sec	3	A
I_5	Pin 5 DC current at $V_7 < V_4$	2	A
I_5	Pin 5 peak to peak flyback current at $f = 50$ Hz, $t_{fly} \leq 1.5$ msec	100	mA
P_{tot}	Total power dissipation at $T_{case} = 60^\circ\text{C}$	3	A
T_{stg}, T_j	Storage and junction temperature	30	W
		-40 to 150	$^\circ\text{C}$

ORDERING NUMBER: TDA 2170

MECHANICAL DATA

Dimensions in mm

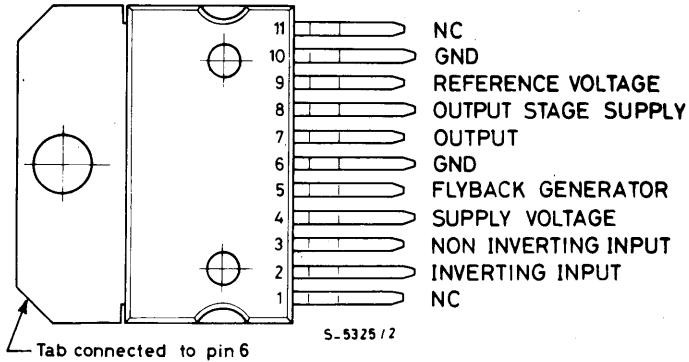




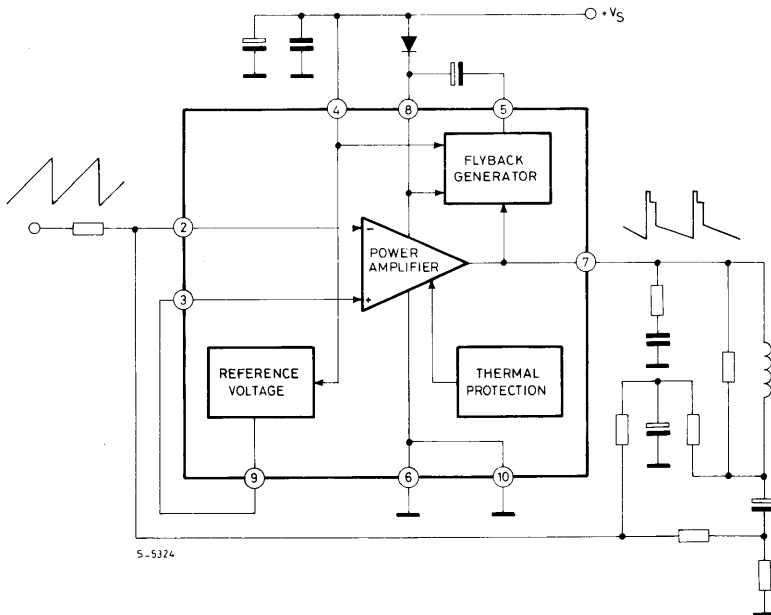
TDA2170

CONNECTION DIAGRAM

(top view)



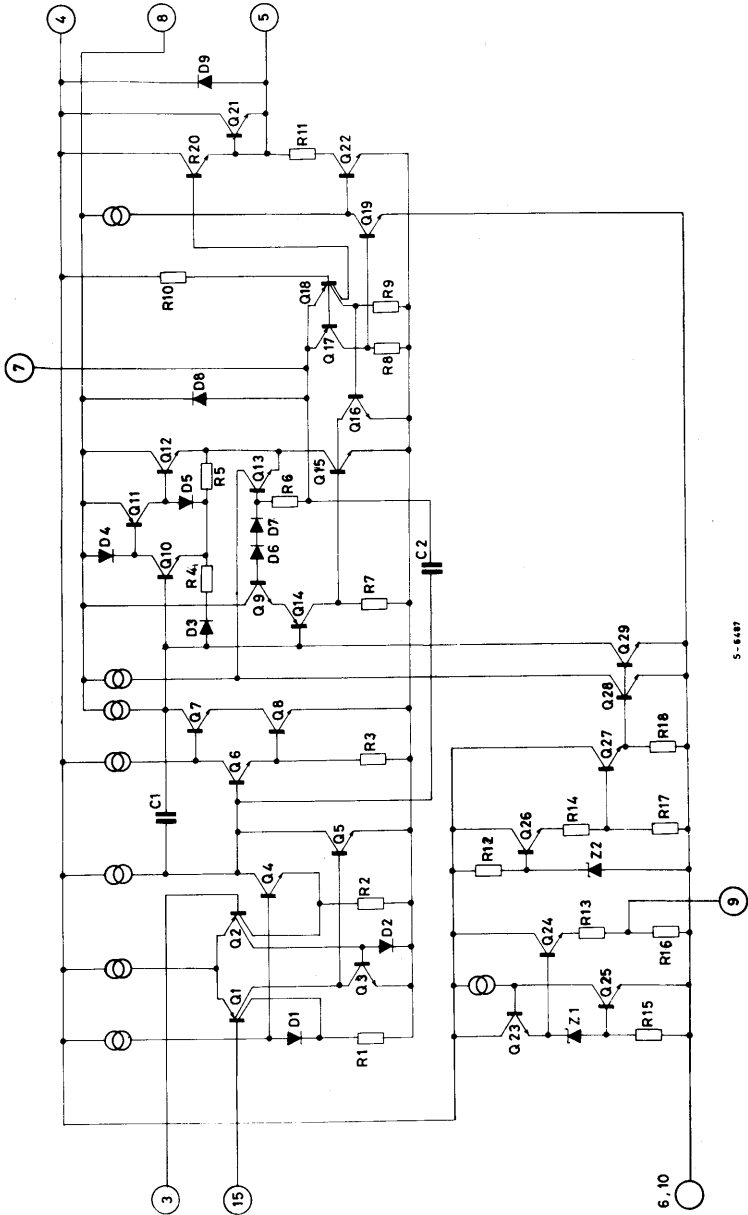
BLOCK DIAGRAM





TDA2170

SCHEMATIC DIAGRAM





THERMAL DATA

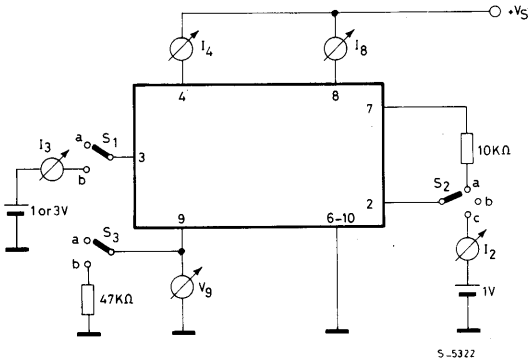
$R_{th\ j-case}$	Thermal resistance junction-case	max	3	°C/W
$R_{th\ j-amb}$	Thermal resistance junction-ambient	max	40	°C/W

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

Parameter	Test conditions	Min.	Typ.	Max.	Unit	Fig.
I_4	Pin 4 quiescent current	$I_5 = 0; I_7 = 0; V_3 = 3V$	8	16	mA	1a
I_8	Pin 8 quiescent current	$I_5 = 0; I_7 = 0; V_3 = 3V$	16	36	mA	1a
I_3	Amplifier input bias current	$V_3 = 1V$	-0.1	-1	μA	1a
I_2	Amplifier input bias current	$V_2 = 1V$	-0.1	-1	μA	1a
V_9	Reference voltage	$I_9 = 0$	2.2		V	1a
$\frac{\Delta V_9}{\Delta V_s}$	Reference voltage drift vs. supply voltage	$V_s = 15 \text{ to } 30V$	1	2	mV/V	1a
V_{5L}	Pin 5 saturation voltage to GND	$I_5 = 20 \text{ mA}$	1		V	1c
V_7	Quiescent output voltage	$V_s = 35V; R_a = 39 \text{ K}\Omega$	18		V	1d
		$V_s = 15V; R_a = 13 \text{ K}\Omega$	7.5		V	1d
V_{7L}	Output saturation voltage to GND	$I_7 = 1.2A$	1	1.4	V	1c
		$I_7 = 0.7A$	0.7	1	V	1c
V_{7H}	Output saturation voltage to supply	$-I_7 = 1.2A$	1.6	2.2	V	1b
		$-I_7 = 0.7A$	1.3	1.8	V	1b
R_9	Reference voltage output resistance		2.1		$K\Omega$	
T_j	Junction temperature for thermal shut down		140		°C	

Fig. 1 - DC test circuits

Fig. 1a - Measurement of I_2 ; I_3 ; I_4 ; I_8 ; V_9 ; $\Delta V_9/\Delta V_S$; R_9



- S_1 : (a) I_2 ; (b) I_3 , I_4 and I_8 .
 S_2 : (a) I_4 and I_8 ; (b) I_3 ; (c) I_2 .
 S_3 : (a) I_2 , I_3 , I_4 , I_8 , I_9 and V_9 ; (b) R_9 .

Fig. 1b - Measurement of V_{7H}

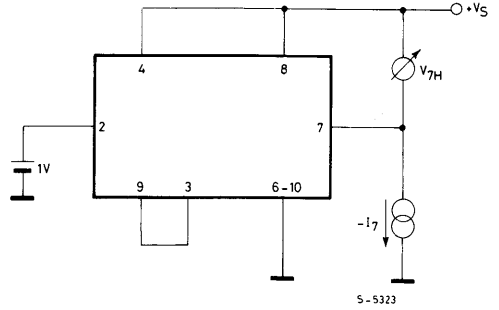
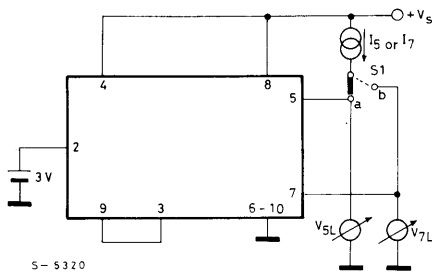


Fig. 1c - Measurement of V_{5L} ; V_{7L}



- S_1 : (a) V_{5L} ; (b) V_{7L} .

Fig. 1d - Measurement of V_7

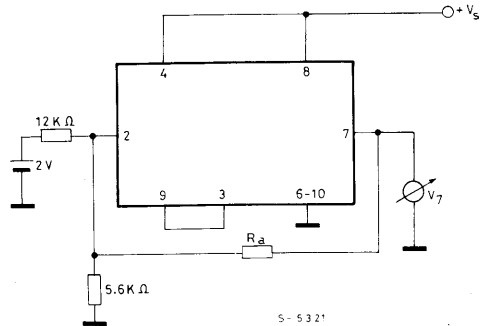


Fig. 2 - Application circuit

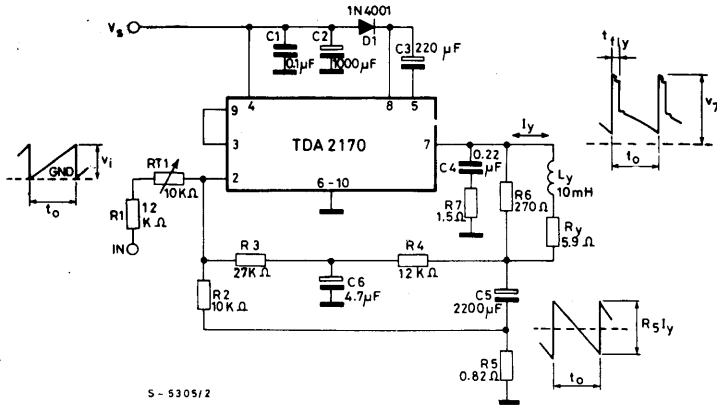
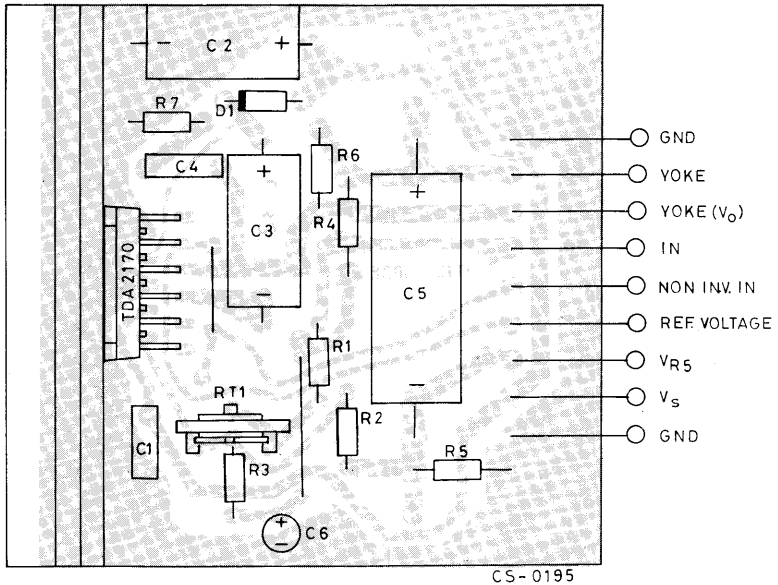


Fig. 3 - PC board and component layout (1:1 scale)



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	V _{pp}
v ₇	50	47	52	V _p

* Worst case condition.