



TDA2270

# LINEAR INTEGRATED CIRCUITS

## PRELIMINARY DATA

### TV VERTICAL DEFLECTION OUTPUT CIRCUIT

- DRIVES VERTICAL DEFLECTION WINDINGS DIRECTLY
- HIGH EFFICIENCY
- INTERNAL FLYBACK GENERATOR
- THERMAL PROTECTION
- ON-CHIP VOLTAGE REFERENCE
- HIGH OUTPUT CURRENT (2.2A PEAK)
- 16-LEAD POWERDIP PLASTIC PACKAGE

The TDA 2270 is a high efficiency monolithic output stage for vertical deflection circuits in TVs and monitors. Driving the vertical windings directly, the device contains a power amplifier, flyback generator, voltage reference and thermal protection circuit.

The TDA 2270 is supplied in a 16-pin DIP with the four center pins connected together and used for heatsinking.

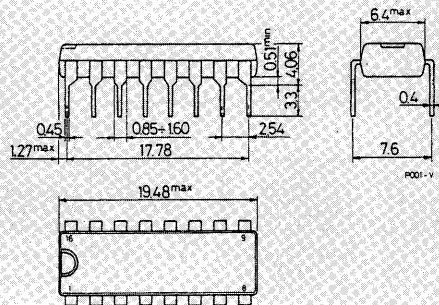
### ABSOLUTE MAXIMUM RATINGS

$V_s$	Supply voltage (pin 1)	35	V
$V_7, V_8$	Flyback peak voltage	60	V
$V_2$	Voltage at pin 2	+ $V_s$	
$V_{15}, V_{16}$	Amplifier input voltage	+ $V_s$	
		- 0.5	V
$I_o$	Output peak current (non repetitive, $t = 2 \text{ ms}$ )	2	A
$I_o$	Output peak current at $f = 50 \text{ Hz}$ , $t \leq 10 \mu\text{s}$	2.2	A
$I_o$	Output peak current at $f = 50 \text{ Hz}$ , $t > 10 \mu\text{s}$	1.2	A
$I_2$	Pin 2 DC current at $V_7 < V_1$	50	mA
$I_2$	Pin 2 peak to peak flyback current at $f = 50 \text{ Hz}$ , $t_{\text{fly}} \leq 1.5 \text{ ms}$	2	A
$P_{\text{tot}}$	Total power dissipation at $T_{\text{pins}} \leq 90^\circ\text{C}$ $T_{\text{amb}} = 70^\circ\text{C}$	4.3	W
$T_{\text{stg}}, T_j$	Storage and junction temperature	-40 to 150	$^\circ\text{C}$

ORDERING NUMBER: TDA 2270

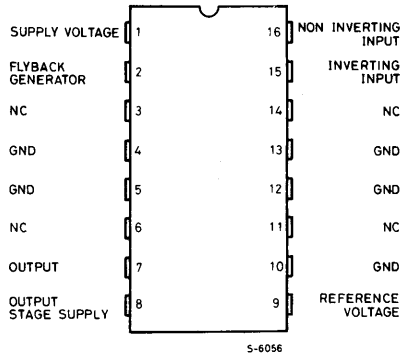
### MECHANICAL DATA

Dimensions in mm

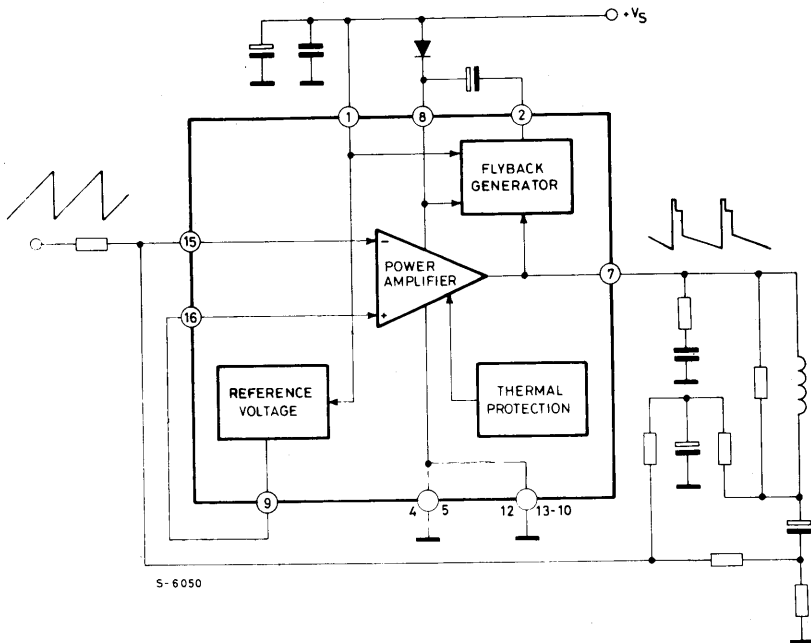


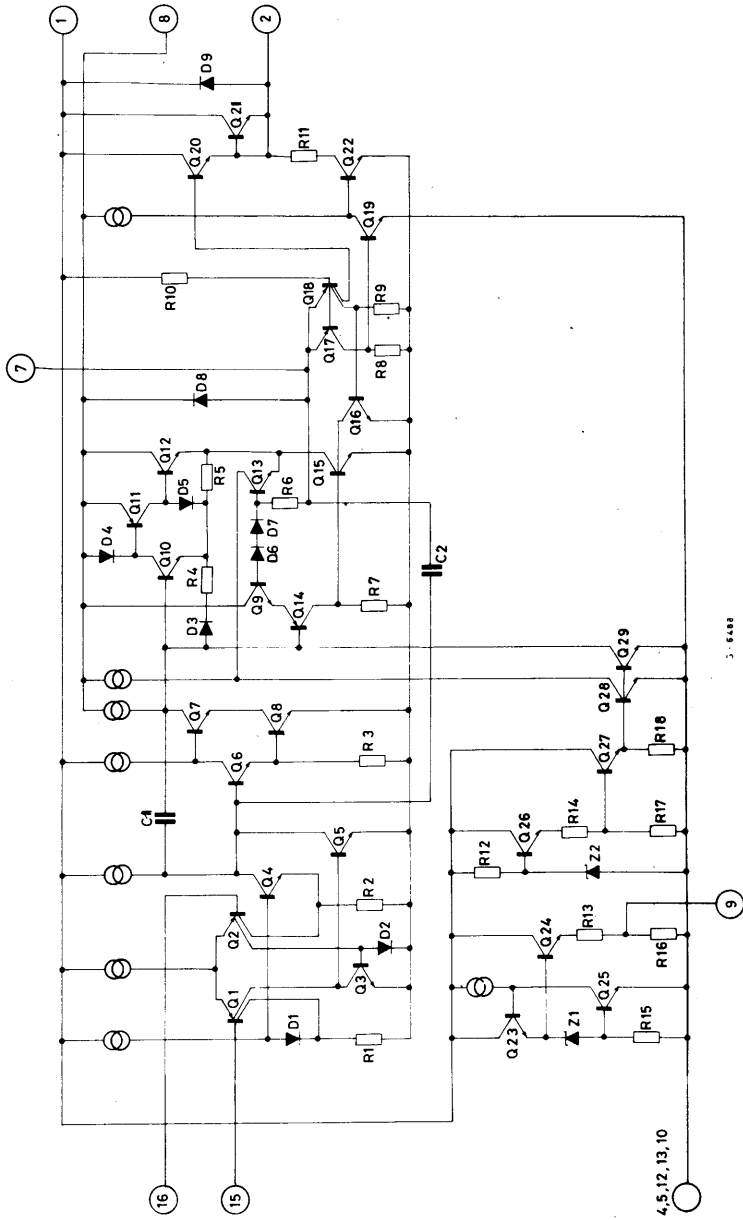
**CONNECTION DIAGRAM**

(top view)



**BLOCK DIAGRAM**



**SCHEMATIC DIAGRAM**


3-6418



## THERMAL DATA

$R_{th\ j-case}$	Thermal resistance junction-case	max	14	°C/W
$R_{th\ j-amb}$	Thermal resistance junction-ambient	max	80	°C/W

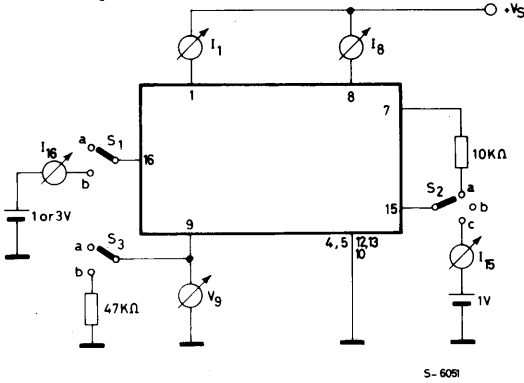
\* Obtained with the GND pins soldered to printed circuit with minimized copper area.

**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.
$I_1$	Pin 1 quiescent current	$I_2 = 0; I_7 = 0; V_{16} = 3V$		8	16	mA	1a
$I_8$	Pin 8 quiescent current	$I_2 = 0; I_7 = 0; V_{16} = 3V$		16	36	mA	1a
$I_{15}$	Amplifier input bias current	$V_{15} = 1V$		-0.1	-1	$\mu A$	1a
$I_{16}$	Amplifier input bias current	$V_{16} = 1V$		-0.1	-1	$\mu A$	1a
$V_{2L}$	Pin 2 saturation voltage to GND	$I_2 = 20\ mA$		1		V	1c
$V_7$	Quiescent output voltage	$V_s = 35V; R_a = 39\ K\Omega$		18		V	1d
		$V_s = 15V; R_a = 13\ K\Omega$		7.5		V	1d
$V_{7L}$	Output saturation voltage to GND	$I_7 = 0.7A$		0.7	1	V	1c
$V_{7H}$	Output saturation voltage to supply	$-I_7 = 0.7A$		1.3	1.8	V	1b
$V_9$	Reference voltage	$I_9 = 0$		2.2		V	1a
$\frac{\Delta V_9}{\Delta V_s}$	Reference voltage drift vs. supply voltage	$V_s = 15\ to\ 30V$		1	2	mV/V	1a
R9	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  $I_1; I_8; I_{15}; I_{16}; V_9;$   
 $\Delta V_9/\Delta V_s; R_9$ .



- S<sub>1</sub> : (a)  $I_{15}$ ; (b)  $I_{16}, I_7$  and  $I_8$ .
- S<sub>2</sub> : (a)  $I_7$  and  $I_8$ ; (b)  $I_{16}$ , (c)  $I_{15}$ .
- S<sub>3</sub> : (a)  $I_{15}, I_{16}, I_7, I_8, I_9$  and  $V_9$ ; (b)  $R_9$ .

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

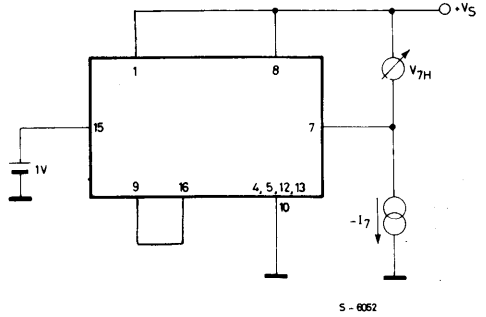
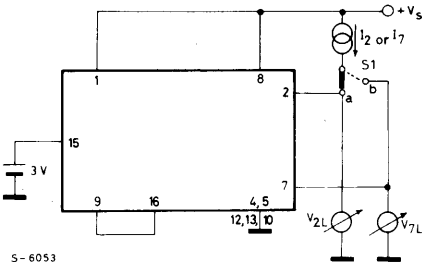


Fig. 1c - Measurement of  $V_{2L}; V_{7L}$



- S<sub>1</sub> : (a)  $V_{2L}$ ; (b)  $V_{7L}$ .

Fig. 1d - Measurement of  $V_7$

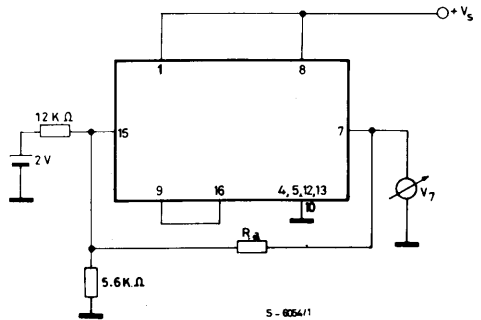


Fig. 2 - Application circuit

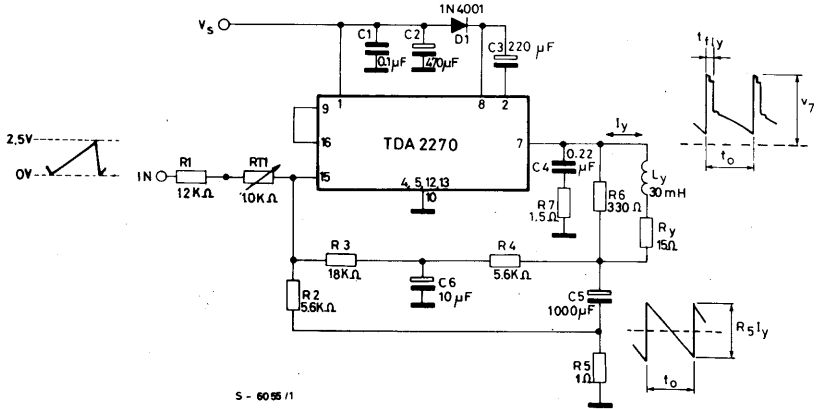
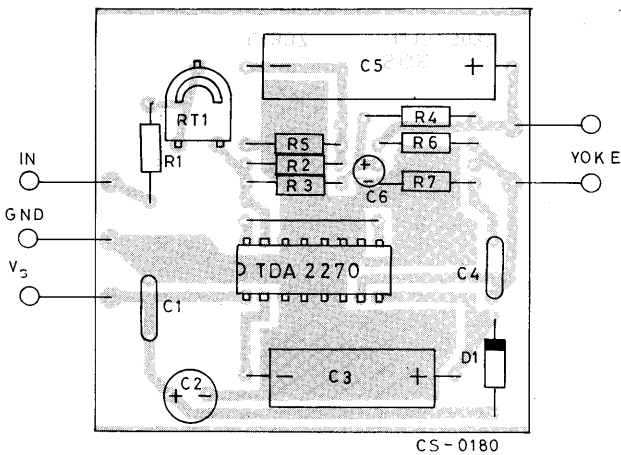


Fig. 3 - PC board and component layout (1:1 scale)





**TDA2270**

**Components list for typical applications** (refer to fig. 2)

Component	B/W TV 10Ω/20mH/1 App	90° TVC 15Ω/30 mH 0.82 App	Unit
RT1	10	10	KΩ
R1	10	12	KΩ
R2	5.6	5.6	KΩ
R3	15	18	KΩ
R4	6.8	5.6	KΩ
R5	1	1	Ω
R6	330	330	Ω
R7	1.5	1.5	Ω
D1	1N 4001	1N 4001	—
C1	0.1	0.1	μF
C2 el.	470/25V	470/25V	μF
C3 el.	220/25V	220/25V	μF
C4	0.22	0.22	μF
C5 el.	1000/25V	1000/16V	μF
C6 el.	10/16V	10/16V	μF

**Typical performance:**

Parameter	B/W TV 10Ω/20mH/1 App	90° TVC 15Ω/30 mH	Unit
V <sub>s</sub> — Supply voltage	20	25	V
I <sub>s</sub> — Current	145	125	mA
t <sub>fly</sub> — Flyback time	0.75	0.7	ms
* P <sub>tot</sub> — Power dissipation	1.8	2.05	W
* R <sub>th c-a</sub> — Heatsink	14	12	°C/W
T <sub>amb</sub>	60	60	°C
T <sub>j max</sub>	130	130	°C
t <sub>o</sub>	20	20	ms
v <sub>i</sub>	2.5	2.5	V <sub>pp</sub>
v <sub>7</sub> — Flyback voltage	42	52	V <sub>p</sub>

\* Worst case condition.