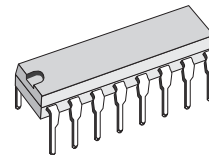


## TV VERTICAL DEFLECTION OUTPUT CIRCUIT

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



**DIP16**  
(Plastic package)

**ORDER CODE : TDA2270**

### PIN CONNECTIONS

SUPPLY VOLTAGE	1	16	NON-INVERTING INPUT
FLYBACK GENERATOR	2	15	INVERTING INPUT
NC	3	14	NC
GND	4	13	GND
GND	5	12	GND
NC	6	11	NC
OUTPUT	7	10	GND
OUTPUT STAGE SUPPLY	8	9	REFERENCE VOLTAGE

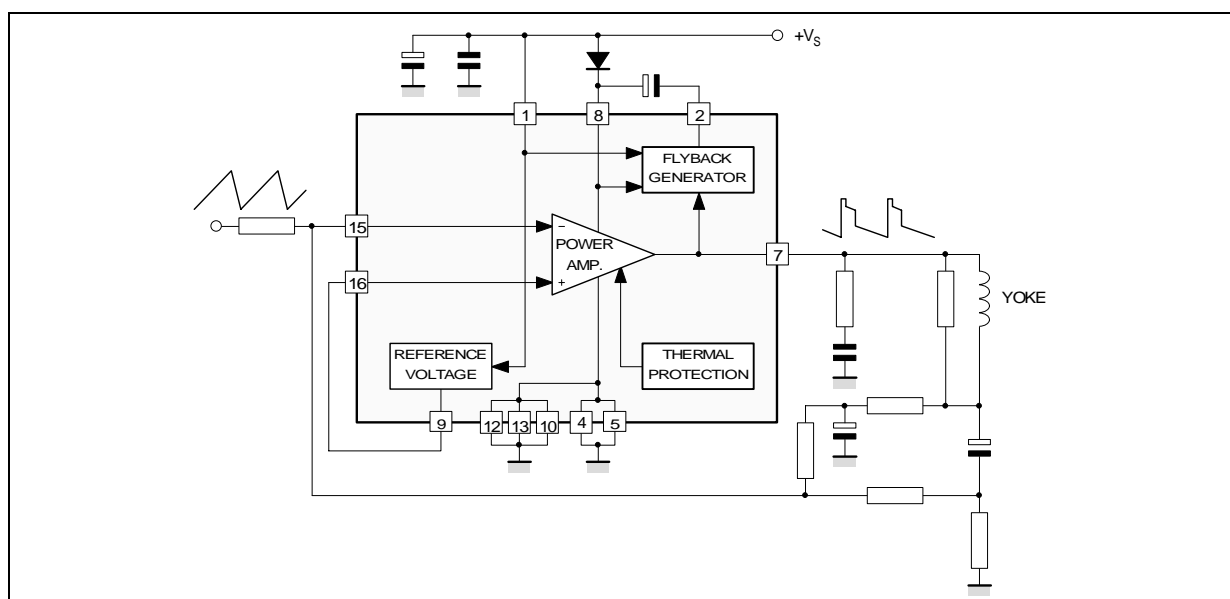
2270-01 EPS

### DESCRIPTION

The TDA2270 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 TDA2270 is supplied in a 16-pin DIP with the four center pins connected together and used for heatsinking.

### BLOCK DIAGRAM



2270-02 EPS

## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$V_s$	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, $t = 2$ ms)	2	A
$I_o$	Output Peak Current at $f = 50$ Hz, $t \leq 10$ $\mu$ s	2.2	A
$I_o$	Output Peak Current at $f = 50$ Hz, $t > 10$ $\mu$ 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 $f = 50$ Hz, $t_{fly} \leq 1.5$ ms	2	A
$P_{tot}$	Total Power Dissipation at $T_{pins} \leq 90$ °C $T_{amb} = 70$ °C	4.3 1	W W
$T_{stg}, T_j$	Storage and Junction Temperature	- 40 to 150	°C

2270-01.TBL

## THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{th\ j-case}$	Thermal Resistance Junction-case Max	14	°C/W
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient Max	80	°C/W

2270-02.TBL

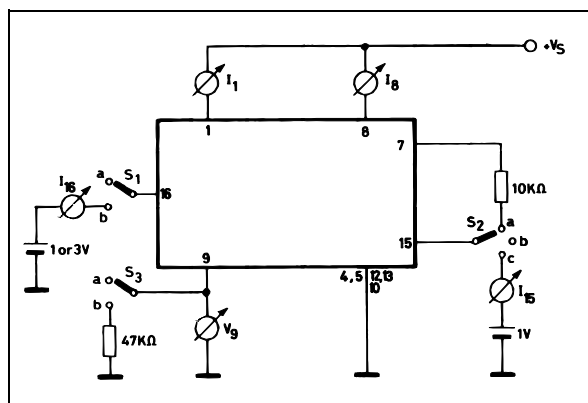
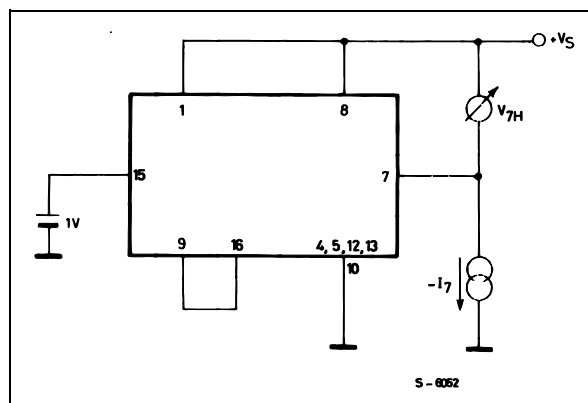
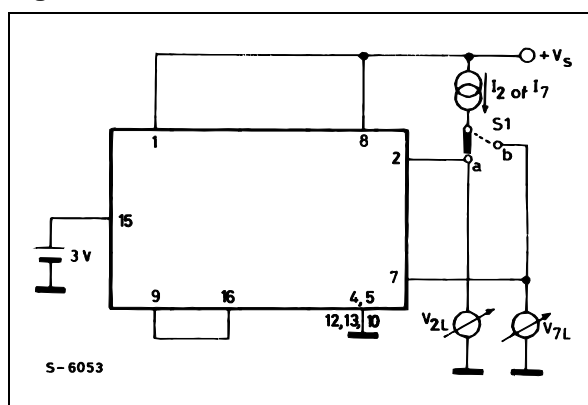
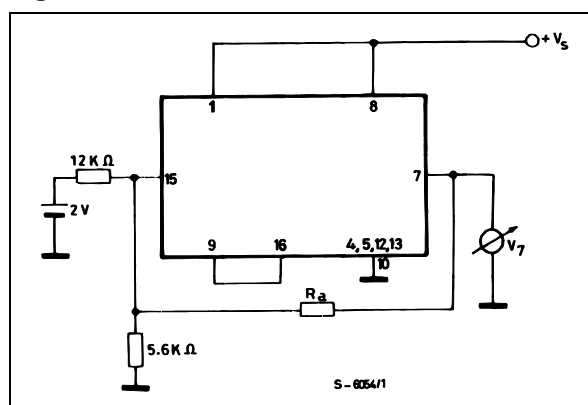
\* Obtained with the GND pins soldered to printed circuit with minimized copper area.

## ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit	Fig.
$I_1$	Pin 1 Quiescent Current	$I_2 = 0, I_7 = 0, V_{16} = 3$ V		8	16	mA	1a
$I_8$	Pin 8 Quiescent Current	$I_2 = 0, I_7 = 0, V_{16} = 3$ V		16	36	mA	1a
$I_{15}$	Amplifier Input Bias Current	$V_{15} = 1$ V		- 0.1	- 1	$\mu$ A	1a
$I_{16}$	Amplifier Input Bias Current	$V_{16} = 1$ V		- 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	$V_s = 35$ V, $R_a = 39$ k $\Omega$ $V_s = 15$ V, $R_a = 13$ k $\Omega$		18 7.5		V V	1d 1d
$V_{7L}$	Output Saturation Voltage to GND	$I_7 = 0.7$ A		0.7	1	V	1c
$V_{7H}$	Output Saturation Voltage to Supply	- $I_7 = 0.7$ A		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 versus Supply Voltage	$V_s = 15$ to 30 V		1	2	mV/V	1a
$R_9$	Reference Voltage Output Resistance			2.1		k $\Omega$	
$T_j$	Junction Temperature for Thermal Shut Down			140		°C	

2270-03.TBL

**Figure 1 : DC Test Circuits****Figure 1a :** Measurement of  $I_1$  ;  $I_8$  ;  $I_{15}$  ;  $I_{16}$  ;  $V_9$  ;  $\Delta V_9/\Delta V_S$  ;  $R_9$ S1 : (a)  $I_{15}$  ; (b)  $I_{16}$ ,  $I_7$  and  $I_8$ .S2 : (a)  $I_7$  and  $I_8$  ; (b)  $I_{16}$ , (c)  $I_{15}$ .S3 : (a)  $I_{15}$ ,  $I_{16}$ ,  $I_7$ ,  $I_8$ ,  $I_9$  and  $V_9$  ; (b)  $R_9$ **Figure 1b :** Measurement of  $V_{7H}$ **Figure 1c :** Measurement of  $V_{2L}$  ;  $V_{7L}$ S1 : (a)  $V_{2L}$  ; (b)  $V_{7L}$ **Figure 1d :** Measurement of  $V_7$ 



**COMPONENTS LIST FOR TYPICAL APPLICATIONS** (refer to the fig. 2)

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

2270-04.TBL

**TYPICAL PERFORMANCE**

Parameter	B/W TV 10 $\Omega$ / 20 mH / 1 App	90° TVC 15 $\Omega$ / 30 mH	Unit
$V_s$ – Supply Voltage	20	25	V
$I_s$ – Current	145	125	mA
$t_{fly}$ – Flyback Time	0.75	0.7	ms
* $P_{tot}$ – Power Dissipation	1.8	2.05	W
* $R_{th\ c-a}$ – Heatsink	14	12	$^{\circ}$ C/W
$T_{amb}$	60	60	$^{\circ}$ C
$T_{j\ max}$	130	130	$^{\circ}$ C
$t_o$	20	20	ms
$V_i$	2.5	2.5	Vpp
$V_7$ – Flyback Voltage	42	52	Vp

2270-05.TBL

MOUNTING INSTRUCTIONS

The  $R_{th\ j-amb}$  of the TDA 2270 can be reduced by soldering the GND pins to a suitable copper area of the printed circuit board (fig. 4) or to an external heatsink (fig. 5).

The diagram of figure 6 shows the maximum dissippable power  $P_{tot}$  and the  $R_{th\ j-amb}$  as a function of the side "l" of two equal square copper areas having

a thickness of  $35\ \mu$  (1.4 mils).

During soldering the pins temperature must not exceed  $260\ ^\circ\text{C}$  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.

Figure 4 : Example of P.C. Board Copper Area which is Used as Heatsink

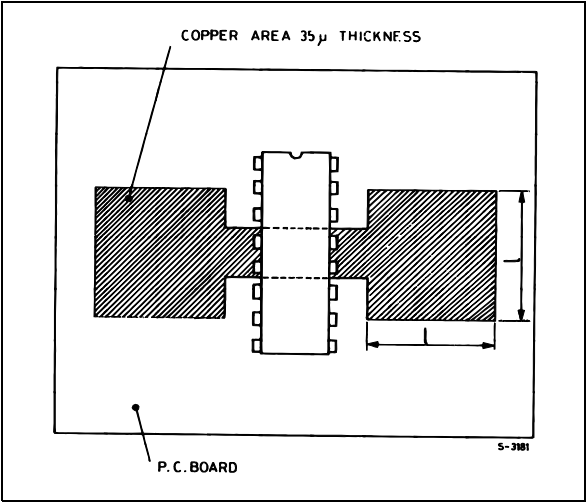


Figure 5 : External Heatsink Mounting Example

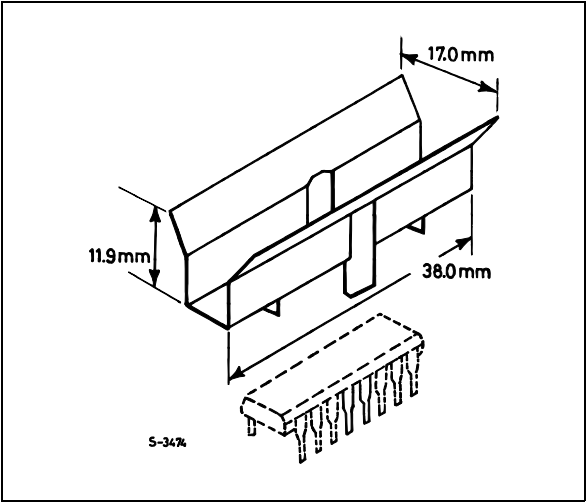


Figure 6 : Maximum Dissippable Power and Junction to Ambient Thermal Resistance versus Side "l"

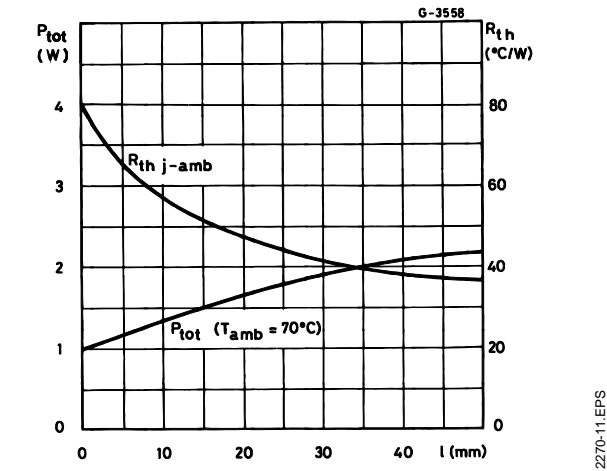
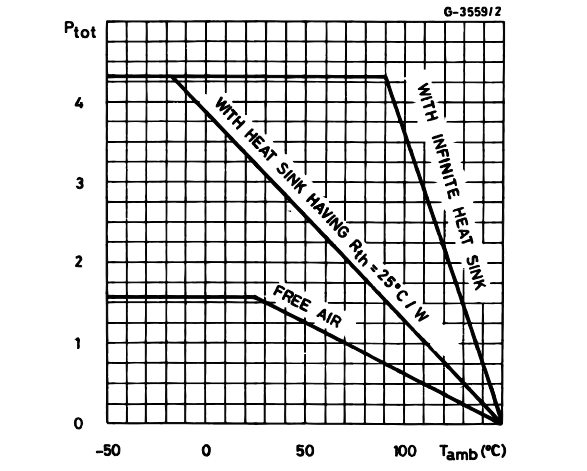
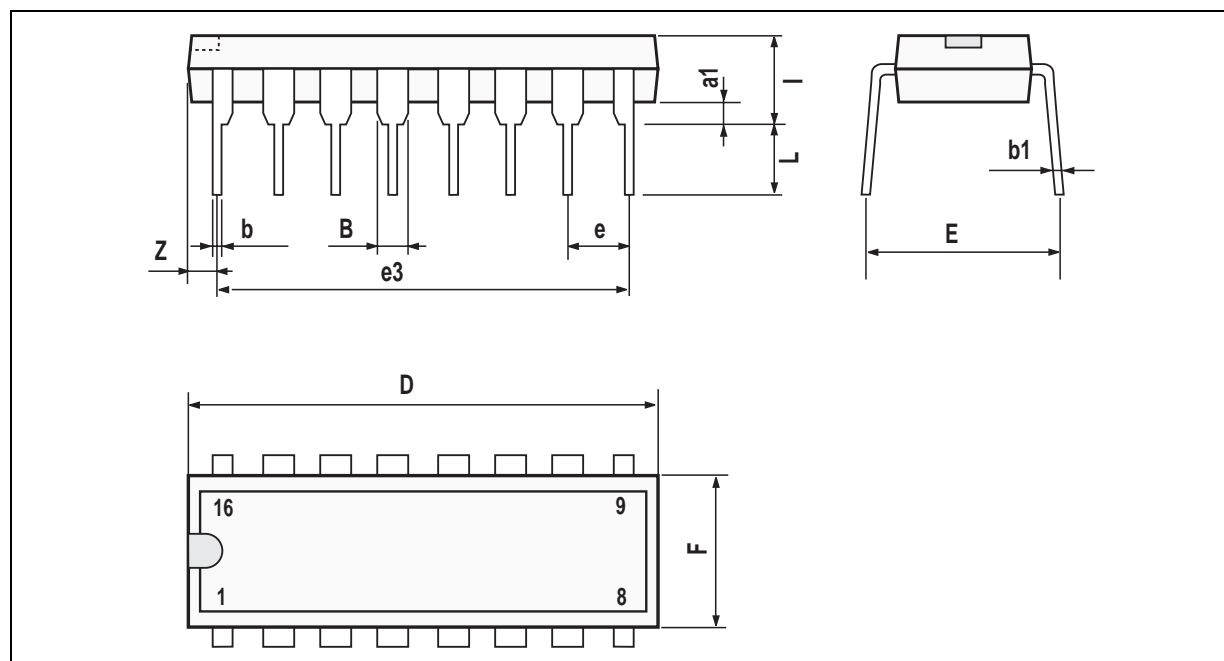


Figure 7 : Maximum Allowable Power Dissipation versus Ambient Temperature



**PACKAGE MECHANICAL DATA****16 PINS - PLASTIC DIP**

PM-DIP16.EPS

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
a1	0.51			0.020		
B	0.77		1.65	0.030		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		17.78			0.700	
F			7.1			0.280
i			5.1			0.201
L		3.3			0.130	
Z			1.27			0.050

DIP-16.TBL

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