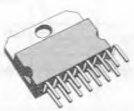
SGS-THOMSON MICROELECTRONICS

TDA1872A

VERTICAL DEFLECTION CIRCUIT

- SYNCHRONIZATION CIRCUIT
- PRECISION OSCILLATOR AND RAMP GENERATOR
- 50/60Hz SYNCHRONIZATION IDENTIFICATION CIRCUIT WITH AUTOMATIC AMPLITUDE CORRECTION AND STATUS OUTPUT
- POWER OUTPUT AMPLIFIER WITH HIGH CURRENT CAPABILITY
- FLYBACK GENERATOR
- VOLTAGE REGULATOR
- PRECISION BLANKING PULSE GENERATOR
- THERMAL SHUT DOWN PROTECTION
- CRT PROTECTION CIRCUIT



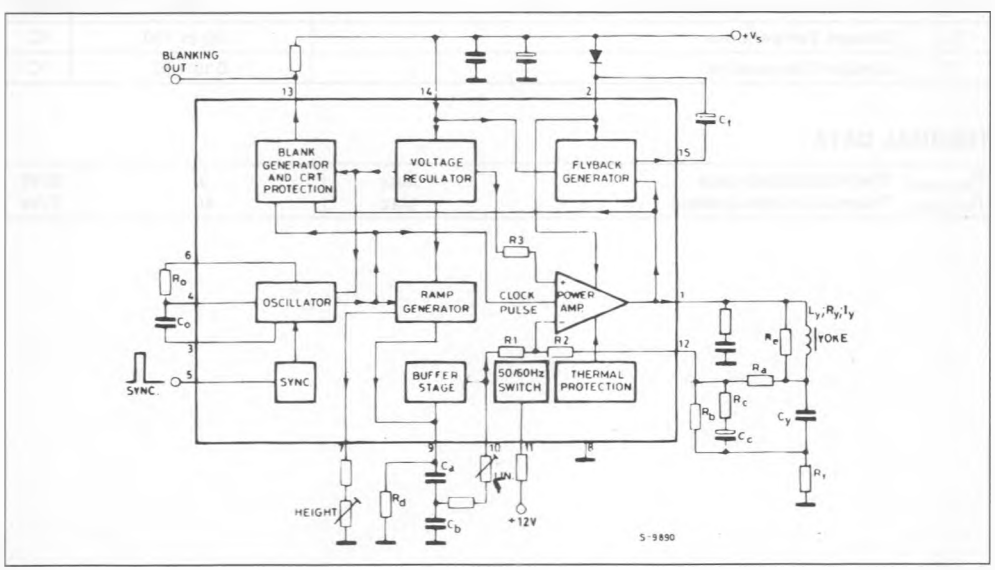
MULTIWATT
(15-lead)

ORDER CODE : TDA1872A

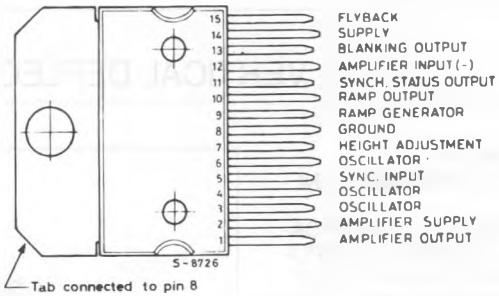
DESCRIPTION

The TDA1872A is a monolithic integrated circuit in 15 lead MULTIWATT package. It is a full performance and very efficient vertical deflection circuit intended for direct drive of the yoke of 110 degree color TV picture tubes.
It offers a wide range of applications also in portable CTVs, BW TVs, monitors and displays.

BLOCK DIAGRAM



PIN CONNECTION (top view)



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_s	Supply Voltage at Pin 14	35	V
V_1, V_2	Flyback Peak Voltage	60	V
V_5	Synchronous Input Voltage	20	V
V_{12}	Power Amplifier Input Voltage	- 10 To V_s	V
V_{13}	Voltage at pin 13	V_s	
I_o	Output Current (non repetitive at t = 20ms)	3	A
I_o	Output Peak Current at f = 50Hz t > 10µs	2	A
I_o	Output Peak Current at f = 50Hz $t_{fly} \leq 1.5$ms	3.5	A
I_{15}	Pin 15 Peak to Peak Flyback Current at f = 50Hz $t_{fly} < 1.5$ms	3	A
I_{15}	Pin 15 DC Current at $V_1 < V_{14}$	100	mA
P_{tot}	Maximum Power Dissipation at $T_{case} \leq 60°C$	30	W
T_{stg}	Storage Temperature	- 40 to 150	°C
T_j	Junction Temperature	0 to 150	°C

THERMAL DATA

$R_{th\ j\text{-}case}$	Thermal Junction-case	Max	3	°C/W
$R_{th\ j\text{-}amb}$	Thermal Junction-ambient	Max	40	°C/W

ELECTRICAL CHARACTERISTICS (V_s = 35V, T_{amb} = 25°C, unless otherwise specified)

DC CHARACTERISTICS

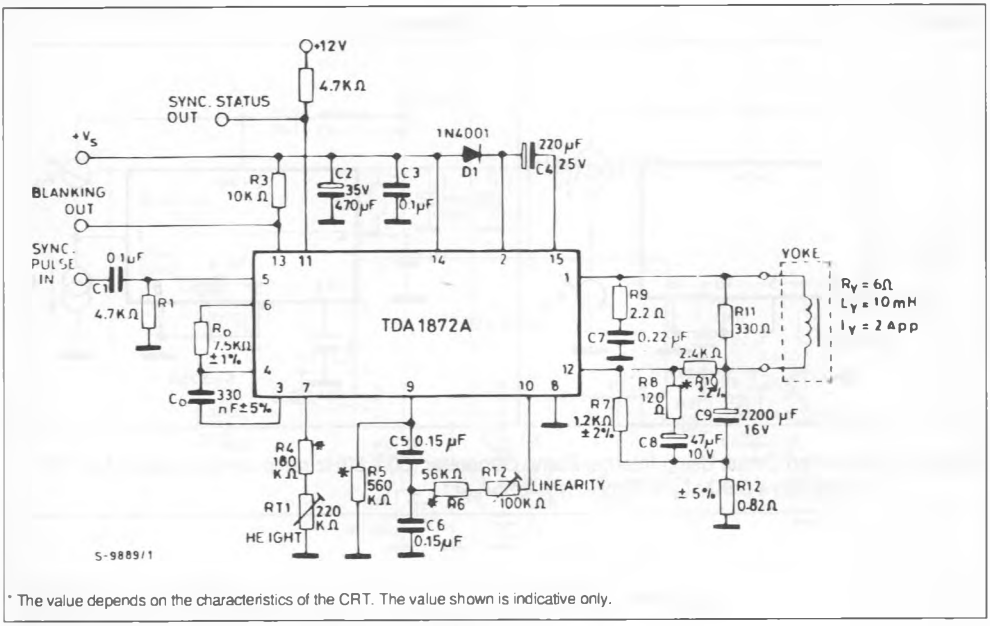
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit	Fig.
I_2	Pin 2 Quiescent Current	$I_1 = 0$		20	40	mA	2b
$-I_9$	Ramp Generator Bias Current	$V_9 = 0$ $-I_7 = 0\mu A$		0.02	1	µA	2b
$-I_9$	Ramp Generator Current	V_9 = 0 to 15V $-I_7 = 20\mu A$	18.5	20	21.5	µA	2b
ΔI_9	Current Variation From 50 to 60Hz	$-I_7 = 20\mu A$	17.7	20	21.1	%	2b
$\frac{\lvert\Delta I_9\rvert}{I_9}$	Ramp Generator non Linearity	V_9 = 0 to 15V $-I_7 = 20\mu A$		0.2	1	%	2b
I_{14}	Pin 14 Quiescent Current			25	45	mA	2b
V_1	Quiescent Output Voltage	V_s = 35V $R_a = 2.2K\Omega$ $R_b = 1K\Omega$	16.4	17.8	19.5	V	2a
		V_s = 15V $R_a = 390\Omega$ $R_b = 1K\Omega$	6.9	7.5	8.1	V	
V_{1L}	Output Saturation Voltage to Ground	I_1 = 1.2A		1	1.4	V	2c
V_{1H}	Output Saturation Voltage to Supply	$-I_1$ = 1.2A		1.6	2.2	V	2d
V_4	Oscillator Virtual Ground			0.45		V	2b
V_7	Regulated Voltage at Pin 7	$-I_7 = 20\mu A$	6.3	6.6	6.9	V	2b
$\frac{\Delta V_7}{\Delta V_s}$	Regulated Voltage Drift with Supply Voltage	ΔV_s = 15 to 35V		1	2	$\frac{mV}{V}$	2b
V_{13}	Blanking Output Saturation Voltage	I_{13} = 10mA		0.35	0.5	V	2a
V_{15}	Pin 15 Saturation Voltage to Ground	I_{15} = 20mA		1.2	1.8	V	2a

ELECTRICAL CHARACTERISTICS (Refer to the AC test circuits of fig.1, T_{amb} = 25°C, V_s = 24V, f = 50Hz, unless otherwise specified)

AC CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_s	Supply Current	$I_y = 2A_{pp}$		295		mA
I_5	Sync. Input Current Required to Sync.		100			µA
$-I_7$	Current at Pin 7	$I_y = 2A_{pp}$	36.3	38	39.7	µA
V_1	Flyback Voltage	$I_y = 2A_{pp}$		50		V
V_3	Peak to Peak Oscillator Sawtooth Voltage	$I_5 = 0$		3.6		V
		$I_5 = 100\mu A$		3.4		
V_{10thL}	Start Scan Level of the Input Ramp			1.85		V
t_{fly}	Flyback Time	$I_y = 2A_{pp}$		0.6		ms
t_{blank}	Blanking Pulse Duration	f_o = 50Hz T_j = 75°C	1.25	1.4	1.47	ms
		f_o = 60Hz T_j = 75°C		1.17		
f_o	Free Running Frequency	R_o = 7.5KΩ T_j = 75°C C_o = 330nF	41.5	44	46	Hz
		R_o = 6.2KΩ T_j = 75°C C_o = 330nF		52.5		Hz
Δf	Synchronization Range	$I_5 = 100\mu A$ T_j = 75°C	19	20		Hz
V_{11}	Sync. Status Output	f = 50Hz or Unsynchronized			1.5	V
		f = 60Hz	10.5			
T_j	Junction Temperature for Thermal Shut-down			145		°C

Figure 1 : AC Test Circuit.



* The value depends on the characteristics of the CRT. The value shown is indicative only.

Figure 2 : DC Test Circuits.

Figure 2a.

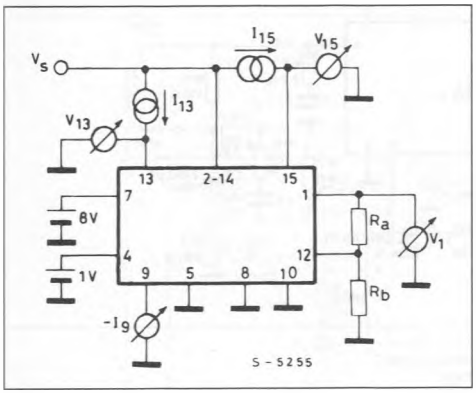


Figure 2b.

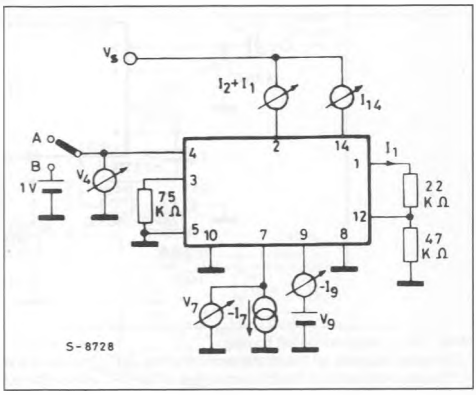


Figure 2 : DC Test Circuits (continued).

Figure 2c.

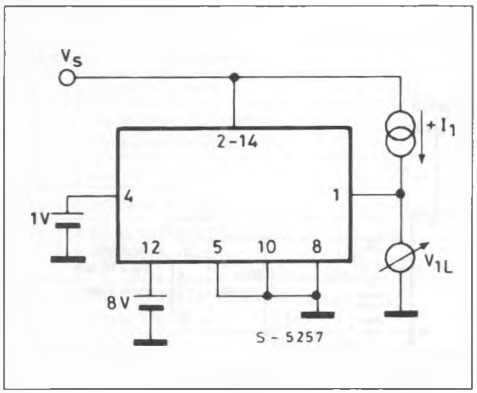


Figure 2d.

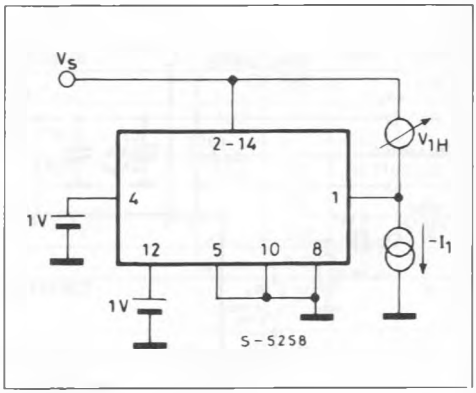
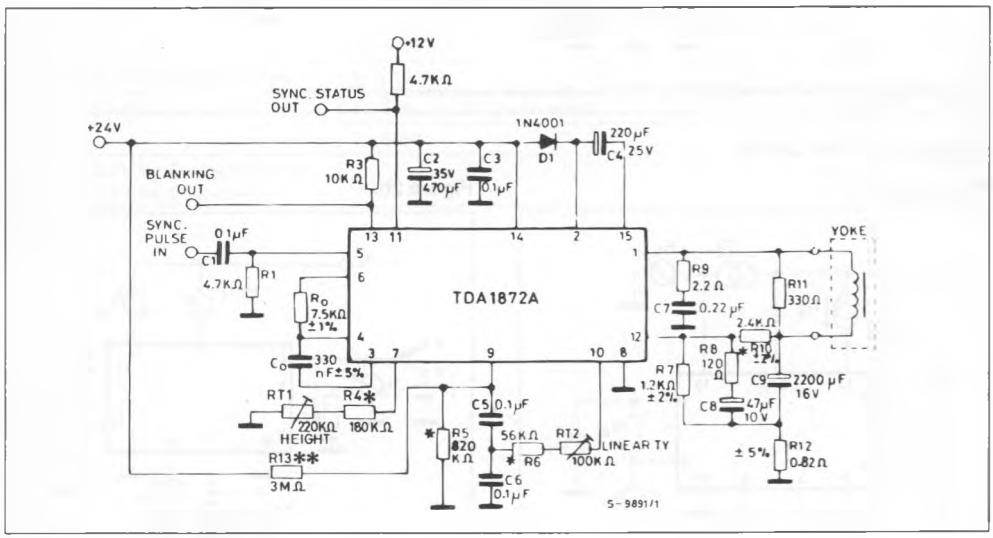


Figure 3 : Application Circuit Using Internal Ramp Generator (50 ÷ 60Hz ramp compensation) for 110° TVC set (R_T = 5.9Ω ; L_y = 10mH ; Iy = 1.95A_{pp}).

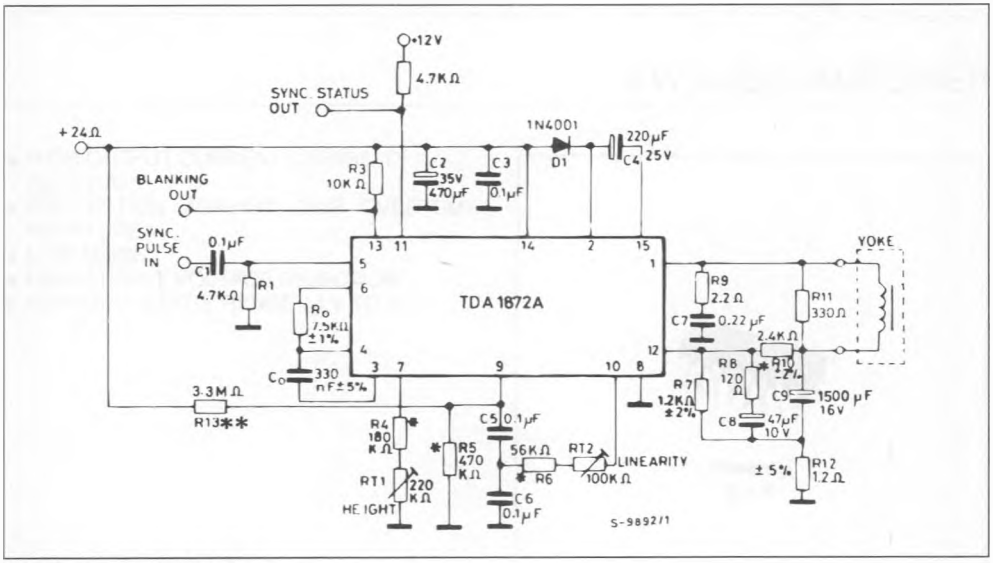


Note : Pin 11 must not be left floating.

* The value depends on the characteristics of the CRT. The value shown is indicative only.

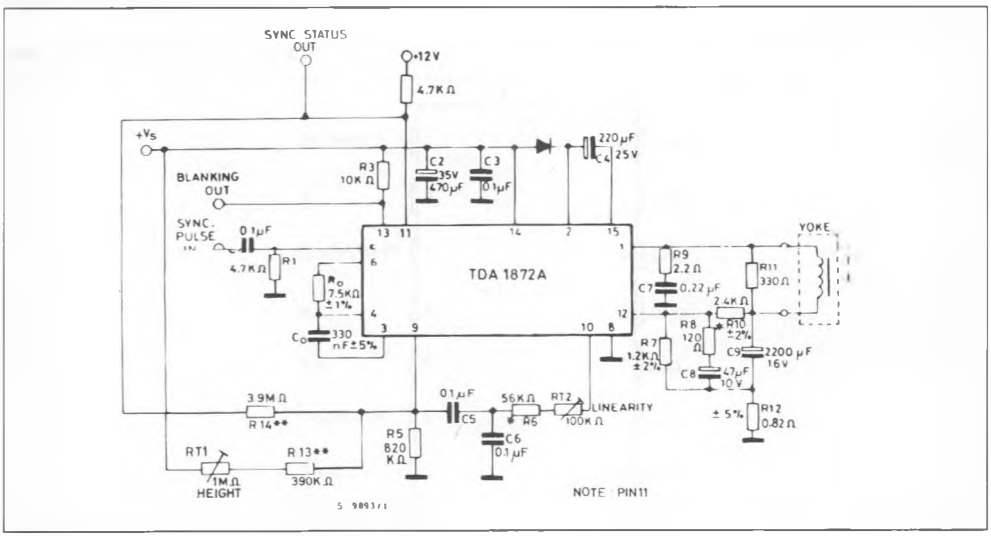
** The value depends on the characteristics of the CRT and on the supply voltage.

Figure 4 : Applicaiton circuit (50 ÷ 60Hz ramp Compasation) for 110° RVC set (R_T = 9.6Ω ; L_y = 24.6mH ; I_y = 1.2A$_{PP}$).



Note : Pin 11 must not be left floating.
* The value depends on the characteristics of the CRT. The value shown is indicative only.
** The value depends on the characteristics of the CRT and on the supply voltage.

Figure 5 : Application Circuit Using External Ramp Generator (50 ÷ 60Hz ramp and pumping compensation).



Note : Pin 11 must not be left floating.
* The value depends on the characteristics of the CRT. The value shown is indicative only.
** The value depends on the characteristics of the CRT and on the supply voltage.