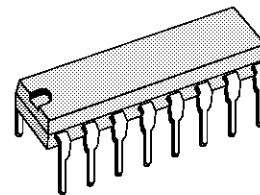


**SYNCHRO AND HORIZONTAL DEFLECTION
CONTROL FOR COLOR TV SET**

- LINE OSCILLATOR (two levels switching)
- PHASE COMPARISON BETWEEN SYNCHRO-PULSE AND OSCILLATOR VOLTAGE Ø 1, ENABLED BY AN INTERNAL PULSE, (better parasitic immunity)
- PHASE COMPARISON BETWEEN THE FLYBACK PULSES AND THE OSCILLATOR VOLTAGE Ø 2
- COINCIDENCE DETECTOR PROVIDING A LARGE HOLD-IN-RANGE
- FILTER CHARACTERISTICS AND GATE SWITCHING FOR VIDEO RECORDER APPLICATION
- NOISE GATED SYNCHRO SEPARATOR
- FRAME PULSE SEPARATOR
- BLANKING AND SAND CASTLE OUTPUT PULSES
- HORIZONTAL POWER STAGE PHASE LAGGING CIRCUIT
- SWITCHING OF CONTROL OUTPUT PULSE WIDTH
- SEPARATED SUPPLY VOLTAGE OUTPUT STAGE ALLOWING DIRECT DRIVE OF SCR'S CIRCUIT
- SECURITY CIRCUIT MAKES THE OUTPUT PULSE SUPPRESSED WHEN LOW SUPPLY VOLTAGE

DESCRIPTION

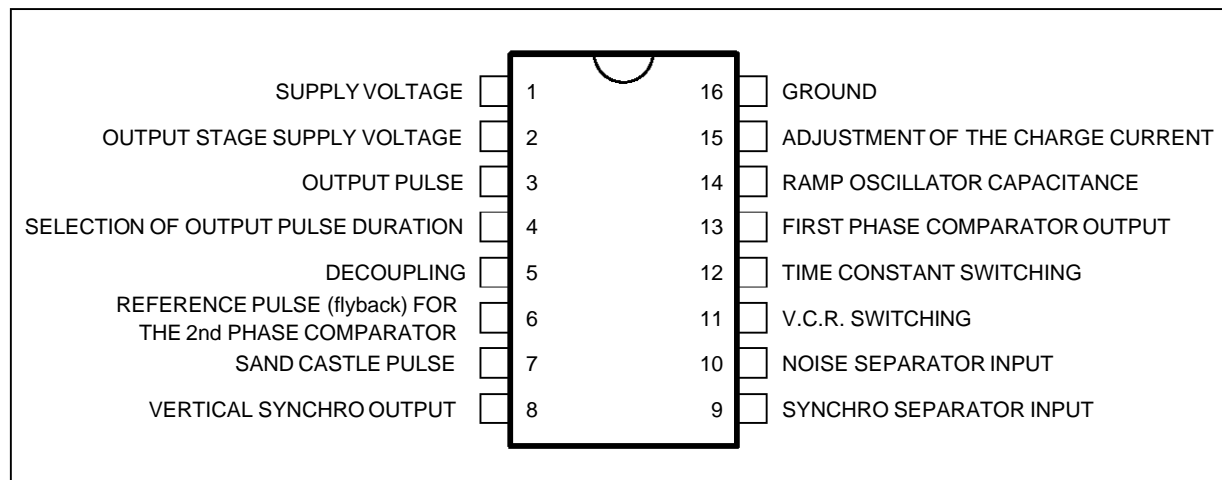
The TDA2593 is a circuit intended for the horizontal deflection of color TV sets, supplied with transistors or SCR'S.



DIP16
(Plastic Package)

ORDER CODE : TDA2593

PIN CONNECTIONS



2593-01.EPS

TDA2593

MAIN CHARACTERISTICS

Symbol	Parameter	Typ.	Unit
V(1-16)	Supply Voltage	12	V
I(1)	Supply Current	30	mA

INPUT SIGNALS

V(9-16) (pp)	Synchro Separator Input Voltage	3 to 4	V
V(10-16) (pp)	Noise Separators Input Voltage	3 to 4	V
V(4-16)	Control Voltage of the Output Pulse Switching Circuit t = 7 μs (thyristor) t = 14 μs + t _d (transistor) t = 0 (V(3-16) = 0)	9.4 to V(1-16) 0 to 3.5 5.4 to 5.6	V
V(4-16)			V
V(4-16)			V

OUTPUT SIGNALS

V(8-16) (pp)	Frame Synchro Pulse	11	V
V(7-16) (pp)	Sandcastle Pulse	11	V
V(3-16) (pp)	Horizontal Driver Stage Control Pulse	10.5	V

2593-01.TBL

ABSOLUTE MAXIMUM RATINGS (Maximum Ratings according to CEI 134 Datasheet)

Symbol	Parameter	Value	Unit
V(1-16)	Supply Voltage to Pin 1	13.2	V
V(2-16)	Supply Voltage to Pin 2	18	V
V(4-16)	Voltage to Pin 4	13.2	V
V(9-16)	Voltage to Pin 9	±6	V
V(10-16)	Voltage to Pin 10	±6	V
V(11-16)	Voltage to Pin 11	13.2	V
I _{2M} = -I _{3M}	Current at Pins 2 and 3 (with thyristor)	650	mA
I _{2M} = I _{3M}	Current at Pins 2 and 3 (with transistor)	400	mA
I(4)	Current to Pin 4	1	mA
I(6)	Current to Pin 6	±10	mA
I(7)	Current to Pin 7	-10	mA
I(11)	Current to Pin 11	2	mA
P _{tot}	Power Dissipation	800	mW
T _{oper}	Operating Ambient Temperature	-20, +70	°C
T _{stg}	Storage Temperature	-25, +125	°C

2593-02.TBL

ELECTRICAL OPERATING CHARACTERISTICS

(T_{amb} = 25°C, V₁-V₁₆ = 12V, unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
V ₉₋₁₆	Input Signals Synchro Separator (Pin 9) Input Threshold Voltage		0.8		V
I ₉	Input Threshold Current			5	μA
I ₉	On-state Input Current		5 to 100		μA
I ₉	Disconnect Input Current	100	150		μA
I ₉	Off-state Input Current (V ₉₋₁₆ = -5V)			-1	μA
V ₉	Video Input Signal (positive synchro pulses) (note 1)		3 to 4		V _{PP}
V ₁₀₋₁₆	Noise Separator (Pin 10) Input Threshold Voltage		1.4		V

2593-03.TBL

Note : 1. Allowed range 1 to 7V

ELECTRICAL OPERATING CHARACTERISTICS(T_{amb} = 25°C, V₁-V₁₆ = 12V, unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
I ₁₀	Input Threshold Current	100	150		μA
I ₁₀	Input Current		5 to 100		μA
I ₁₀	Off-state Input Current (V ₁₀₋₁₆ = -5V)			-1	μA
V ₁₀	Video Input Signal (positive synchro pulses) (note 1)		3 to 4		V _{PP}
V ₁₀	Allowed superimposed parasitic signal			7	V
V ₆₋₁₆	Fly-back Pulse (Pin 6) Input Threshold Voltage		1.4		V
V ₆	Input Limitation Level		-0.7 and +1.4		V
I ₆	Input Current	0.01	1	2	mA
V ₄₋₁₆	Output Pulse Width Control Switch (Pin 4) Input Voltage t = 7 μs (thyristor) t = 14 μs + t _d (transistor) t = 0 (V ₃₋₁₆ = 0) (note 2)		9.4 to V ₁₋₁₆ 0 to 3.5 5.4 to 6.6		V V V
I(4)	Input Current t = 7 μs (thyristor) t = 14 μs + t _j (transistor) t = 0 (V ₃₋₁₆ = 0)	200 200	0		μA μA μA
V ₁₁₋₁₆	Video Recorder Switch (Pin 11) Input Voltage (Pin 11 low level) (Pin 11 to +V _{CC})		0 to 2.5 9 to V ₁₋₁₆		V V
I ₁₁	Input Current (Pin 11 low level) (Pin 11 to +V _{CC})			200 2	μA mA
V ₈₋₁₆	Output Signals Frame Synchro Pulses (positive) (Pin 8) Output Voltage (peak value)	10	11		V
R ₈	Output Impedance		2		kΩ
t _{on}	Delay Between Leading Edge of Input Signal and Leading Edge of Output Signal		15		μs
t _{off}	Delay Between Trailing Edge of Input Signal and Trailing Edge of Output Signal		15		μs

SANDCASTLE PULSE (POSITIVE) (PIN 7)

V ₇₋₁₆	Output Voltage (peak value)	10	11		V
R ₇	Output Impedance		70		Ω
I ₇	Output Current During Trailing Edge		2		mA
t ₇	Sandcastle Pulse Width (V ₇ = 7 V)	3.7		4.3	μs
Δt	Phase Between Middle Input Synchro Pulse and Leading Edge of Sandcastle Pulse (V ₇ = 7 V)	2.15		3.15	μs

FLY-BACK BLANKING PULSE (PIN 7)

V ₇₋₁₆	Output Voltage (peak value)	4		5	V
R ₇	Output Impedance		70		Ω
I ₇	Output Current During Trailing Edge		2		mA

CONTROL PULSE FOR HORIZONTAL DRIVER (POSITIVE) (PIN 3)

V ₃₋₁₆	Output Voltage (peak value)		10.5		V
R ₃	Output Impedance (leading edge) (trailing edge)		2.5 20		Ω Ω
t ₃ t ₃	Control Pulse Width V ₄ = 9.4 to V ₁₋₁₆ V ₄ = 0 to 4V (note 3)	5.5	14 + t _c	8.5	μs μs
V ₁₋₁₆	Control pulse is disabled for		4		V

- Notes :**
1. Allowed range 1 to 7V
 2. Or Pin 4 not connected.
 3. With t_r = 12μs

2593-04.TBL

TDA2593

ELECTRICAL OPERATING CHARACTERISTICS (continued)

($T_{amb} = 25^{\circ}\text{C}$, $V_1-V_{16} = 12\text{V}$, unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
--------	-----------	------	------	------	------

OVERALL PHASE RELATIONSHIP

t_z	Phase Between Middle Synchro Pulse and Middle Fly-back Pulse ($t_r = 12 \mu\text{s}$, note 4)	1.9		3.3	μs
$\Delta I/\Delta t$	Sensitivity to Current Adjust		30		$\mu\text{A}/\mu\text{s}$

OSCILLATOR (PINS 14 AND 15)

V_{14-16}	Threshold Voltage (low level) (high level)		4.4 7.6		V V
I_{14}	Current Generator		± 0.47		mA
f	Free Running Frequency ($C_{osc} = 4700\text{pF}$, $R_{osc} = 12\text{k}\Omega$)		15625		Hz
Δf	Tolerance on Frequency (note 5)			± 5	%
$\Delta f/15$	Frequency Control Sensitivity		31		Hz/ μA
Δf	Spread of Frequency		± 10		%
$\frac{\Delta f/f}{\Delta V/V \text{ nom.}}$	Influence of Supply Voltage on Frequency (note 5)			± 0.05	%
Δf	Frequency change when decreasing the supply down to 5 V ($V_{1-16} = 5\text{V}$, note 5)			± 10	%
T	Frequency Temperature Coefficient (note 5)			$\pm 10^{-4}$	Hz/ $^{\circ}\text{C}$

PHASE COMPARATOR $\phi 1$ (PIN 13)

V_{13-16}	Control Voltage Range		3.8 to 8.2		V
I_{13}	Control Current (peak value)		± 1.9 to ± 2.3		mA
I_{13}	Off-state Current ($V_{13-16} = 4$ to 8V)			-1	μA
R_{13}	Output Impedance ($V_{13-16} = 4$ to 8V , note 6) ($V_{13-16} < 3.8\text{V}$ or $> 8.2\text{V}$, note 7)		High Low		
	Control Sensibility		2		kHz/ μs
Δf	Catching and Holding Range		± 780		Hz
$\Delta f/f$	Catching and Holding Range Tolerance (note 5)		± 10		%

PHASE COMPARATOR $\phi 2$ AND PHASE-SHIFT (PIN 5)

V_{5-16}	Control Voltage Range		5.4 to 7.6		V
I_5	Control Current (peak value)		± 1		mA
I_5	Off-state Output Current ($V_{5-16} = 5.4$ to 7.6V)			-5	μA
R_5	Output Impedance ($V_{5-16} = 5.4$ to 7.6V , note 6) ($V_{5-16} < 5.4\text{V}$ or $> 7.6\text{V}$)		High 8		k Ω
t_d	Max. delay Between Output Pulse Leading Edge and Fly-back Pulse Trailing Edge ($t_r = 12 \mu\text{s}$)			15	μs
$\Delta t/\Delta t_d$	Static Control Error			0.2	%

COINCIDENCE DETECTOR (PIN 11)

V_{11-16}	Output Voltage		0.5 to 6		V
I_{11}	Output Current (without coincidence) (with coincidence)		0.1 -0.5		mA mA

TIME CONSTANT SWITCH (PIN 12)

V_{12-16}	Output Voltage		6		V
I_{12}	Output Current		± 1		mA
R_{12}	Output Impedance ($V_{11-16} = 2.5$ to 7V) ($V_{11-16} < 1.5$ or $> 9\text{V}$)		100 60		Ω k Ω

PULSE GENERATOR (INTERNAL)

t	Pulse Width		7.5		μs
---	-------------	--	-----	--	---------------

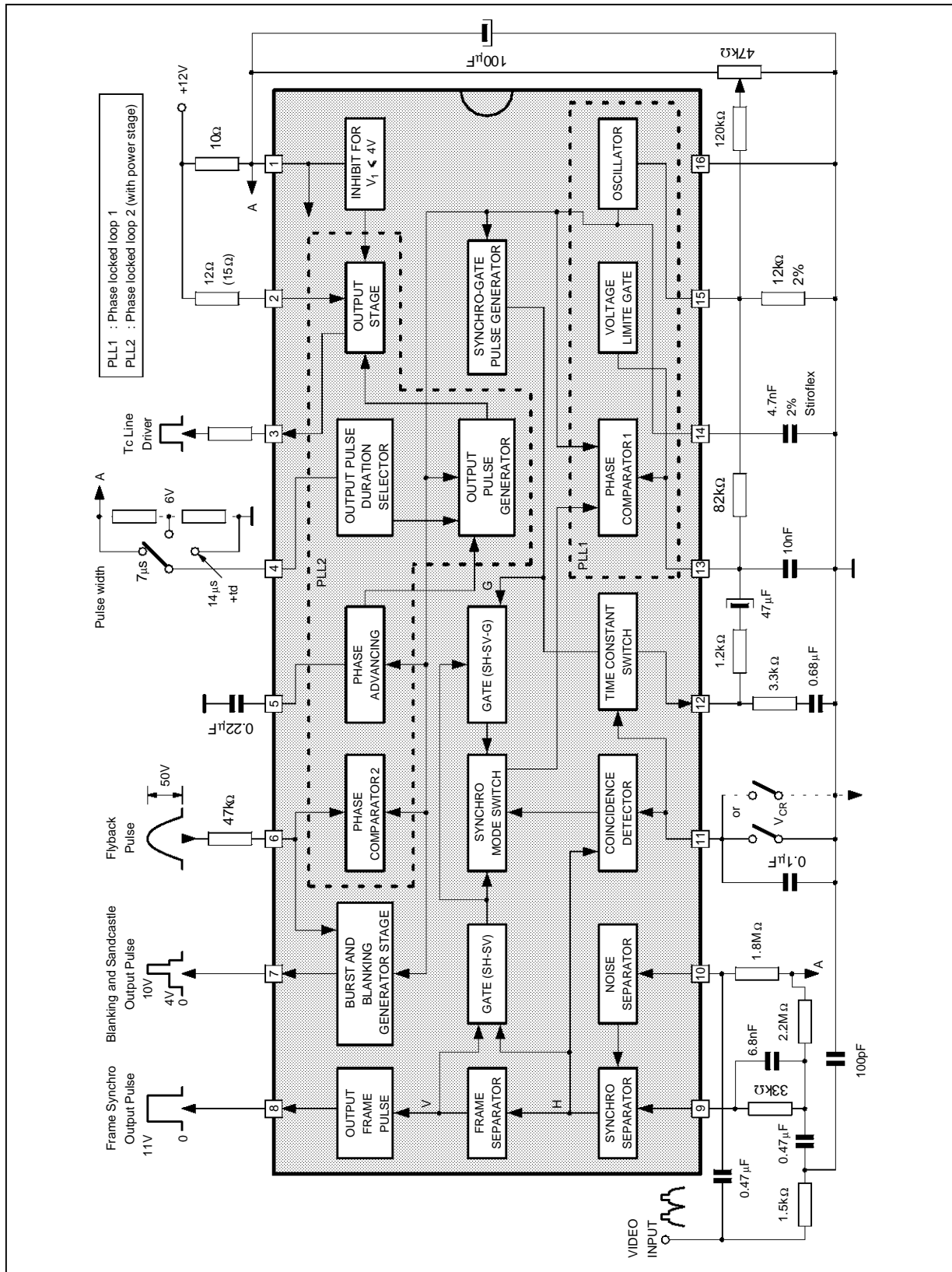
Notes : 4. The adjustment of overall phase relation (and output pulse leading edge position) is automatically performed by phase comparator $\phi 2$. If additional adjustment is needed, a current have to be imposed at pin 5.

5. Tolerance of peripheral components not included.

6. Current generator.

7. Emitter-follower

BLOCK DIAGRAM AND TYPICAL APPLICATION

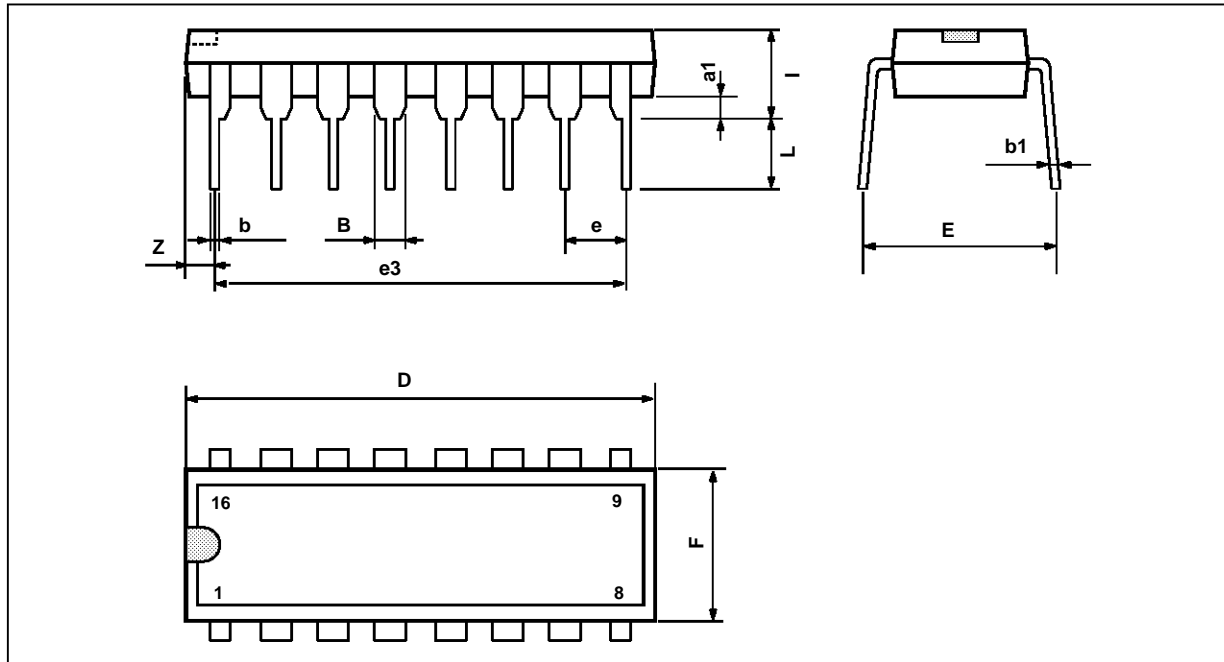


2593-02.EPS

TDA2593

PACKAGE MECHANICAL DATA

16 PINS - PLASTIC DIP



PMDIP16.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

DIP16.TBL

Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No licence is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics - All Rights Reserved

Purchase of I²C Components of SGS-THOMSON Microelectronics, conveys a license under the Philips I²C Patent. Rights to use these components in a I²C system, is granted provided that the system conforms to the I²C Standard Specifications as defined by Philips.

SGS-THOMSON Microelectronics GROUP OF COMPANIES

Australia - Brazil - China - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco
The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.