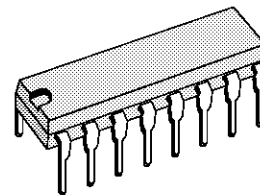


**SYNCHRO AND HORIZONTAL DEFLECTION
CONTROL FOR COLOR TV SET**

- 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

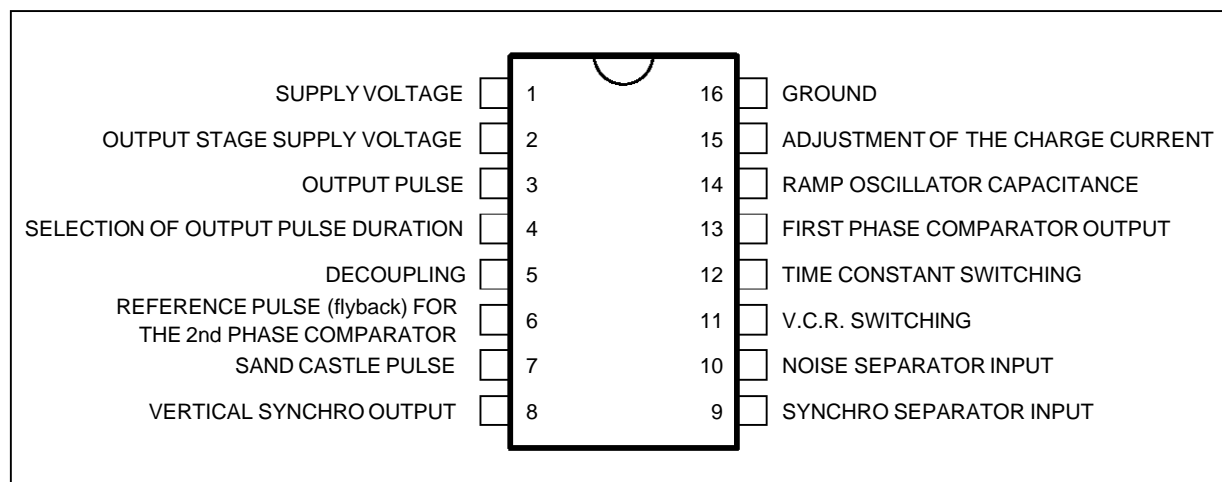
The TDA2593 is a circuit intended for the horizontal deflection of color TV sets, supplied with transistors or SCR'S.



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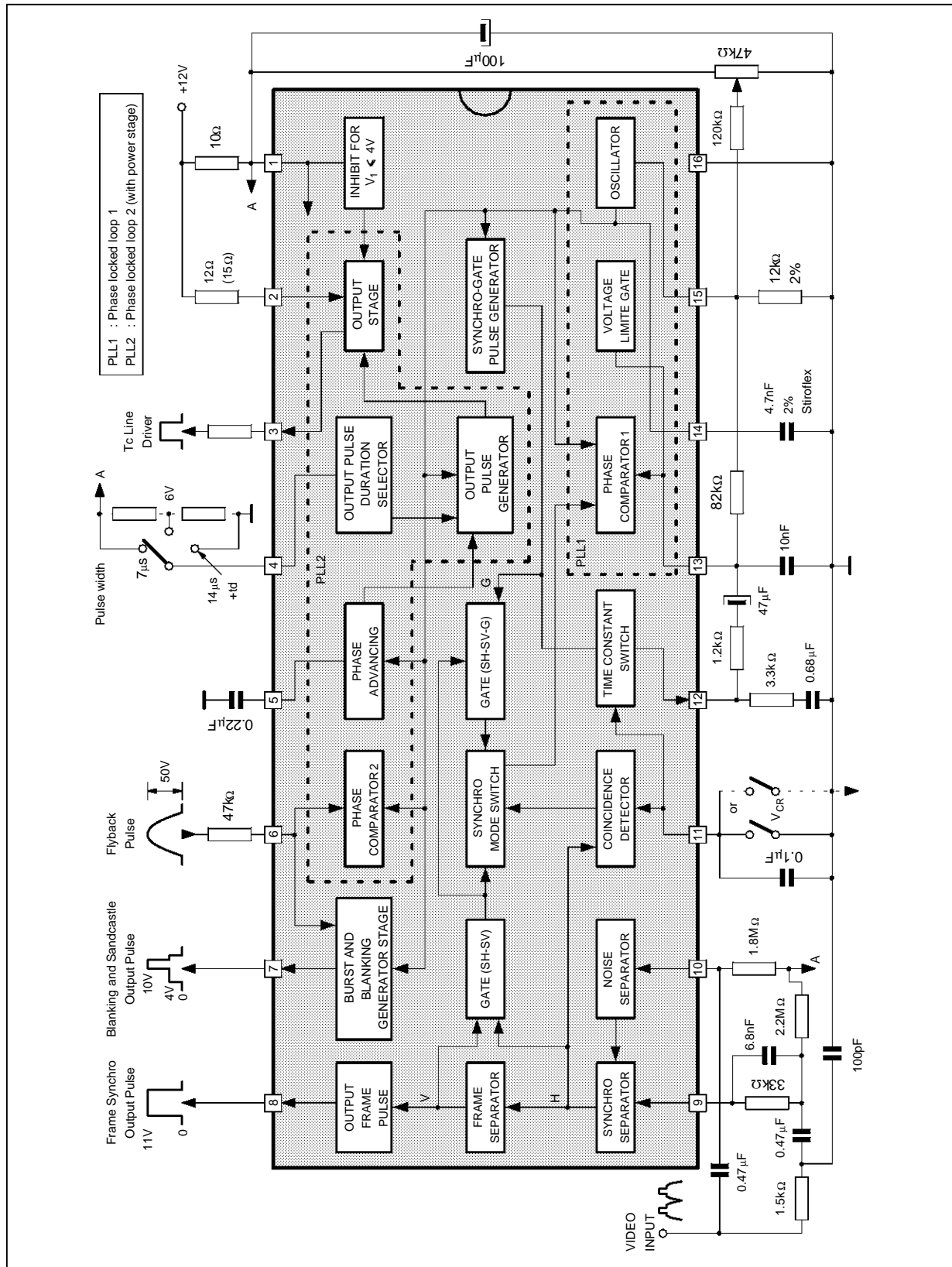
Notes : 4. The adjustment of overall phase relation (and output pulse leading edge position) is automatically performed by phase comparator $\phi 2$. If additional adjustment is needed, a current have to be imposed at pin 5.

5. Tolerance of peripheral components not included.

6. Current generator.

7. Emitter-follower

BLOCK DIAGRAM AND TYPICAL APPLICATION



2593-02.EPS