

**LA7852****CRT Display Synchronization Deflection Circuit****Overview**

The LA7852 is a sync-deflection circuit IC dedicated to CRT display use. It can be connected to the LA7832/7833, 7837/7838 (for vertical output use) to form a sync-deflection circuit that meets every requirement for CRT display use.

So far, ICs for color TV use have been applied to the sync-deflection circuit for CRT display use, and general-purpose ICs such as one-shot multivibrator, inverter and a lot of transistors have been used to form the peripherals such as sync input interface, horizontal phase shifter. The LA7852 contains these peripherals on chip and adopts a stable circuit for horizontal oscillation from 15 kHz to 100 kHz aiming at improving the characteristics required for CRT display use.

The LA7852 has independent GND pins for the horizontal block and vertical block, thus facilitating pattern layout for applications where the LA7852 is used at high frequencies.

Features

- The vertical pull-in range is approximately 10 Hz at $f_v = 60$ Hz.
- The horizontal oscillation frequency can be adjusted stably from 15 kHz to 100 kHz.
- The horizontal display can be shifted right/left.
- The horizontal/vertical sync input can be used intact regardless of the difference in pulse polarity and pulse width.
- The AFC feedback sawtooth wave can be obtained by simply applying a flyback pulse to the IC as a trigger pulse.
- Any duty of the horizontal pulse can be set.
- Good vertical linearity because DC bias at vertical output stage is subjected to sampling control within retrace time.
- Excellent interlace and vertical jitter characteristics on the high-definition display because of independent GND pins for the horizontal block and vertical block.

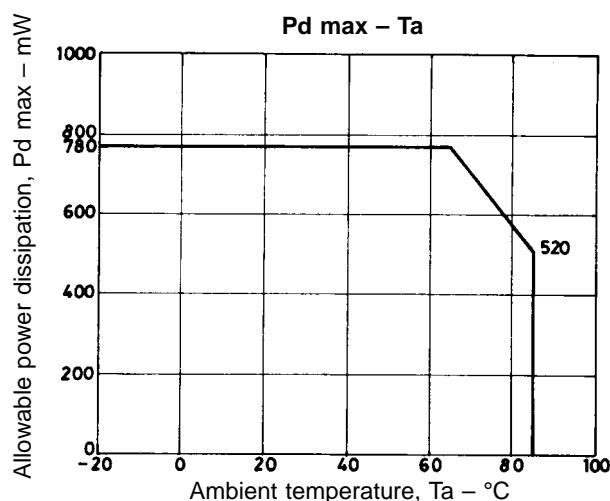
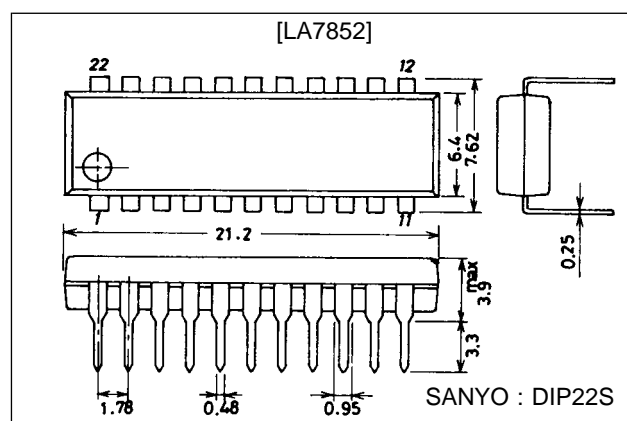
Built-in Functions

[Horizontal Block]

- AFC
- Horizontal OSC
- X-ray protector
- Horizontal phase shift
- AFC sawtooth wave generator
- Horizontal pulse duty setting

Package Dimensions

unit : mm

3059-DIP22S

[Vertical Block]

- Vertical OSC
- Vertical sawtooth wave generator
- Sampling type DC voltage control

Specifications

Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{11}, V_{22}		14	V
Allowable power dissipation	$P_d \text{ max}$	$T_a \leq 65^\circ\text{C}$	780	mW
Operating temperature	T_{opr}		-20 to +85	$^\circ\text{C}$
Storage temperature	T_{stg}		-55 to +125	$^\circ\text{C}$

Operating Conditions at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{11}, V_{22}		12	V
Operating voltage range	V_{11}, V_{22}		9 to 13.5	V
Recommended vertical pulse input peak value	V_{PULSE}		5	Vp-p
Operating vertical pulse input peak value range	V_{PULSE}		2 to 6	Vp-p
Recommended horizontal pulse input peak value	H_{PULSE}		5	Vp-p
Operating horizontal pulse input peak value range	H_{PULSE}		2 to 6	Vp-p

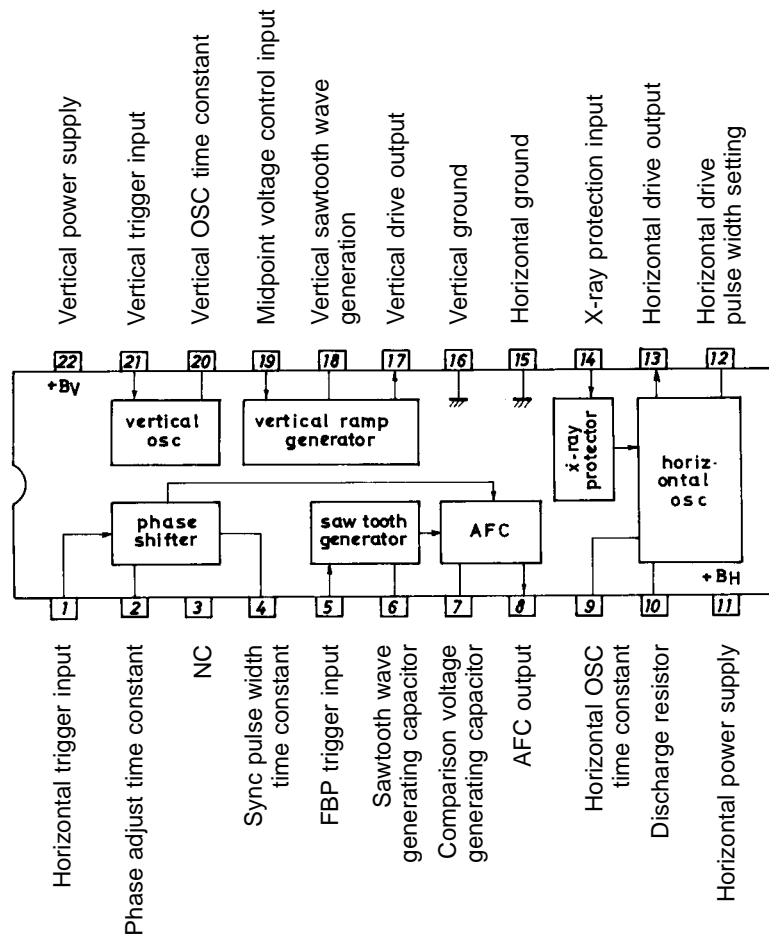
Operating Characteristics at $T_a = 25^\circ\text{C}, V_{11}, V_{22} = 12\text{V}$

Parameter	Symbol	Conditions	min	typ	max	Unit
V_{CC11} current dissipation	I_{11}		12		30	mA
V_{CC22} current dissipation	I_{22}		5		12	mA
Vertical frequency pull-in range	$V_{p \text{ IN}}$	Vertical sync 60 Hz	10.0		12.0	Hz
Vertical free-running frequency	f_v	f_v center 55 Hz	50		60	Hz
Increased/reduced voltage characteristic of vertical frequency	Δf_{v-v}	$V_{22} = 12 \pm 1\text{V}, 55\text{ Hz at } 12\text{ V}$	-0.1		+0.1	Hz
Midpoint control threshold level			3.8		4.4	V
Vertical OSC start voltage	$F_{v\text{-st}}$				4.0	V
Temperature characteristic of vertical frequency		$T_a = -10\text{ to } +60^\circ\text{C}$	-0.028		+0.028	Hz/ $^\circ\text{C}$
Vertical driver amplification factor	G_v		12		18	dB
Horizontal AFC DC loop gain	I_{AFC+}		0.85		1.6	mA
	I_{AFC-}		-1.6		-0.85	mA
Horizontal free-running frequency	f_H	f_H center 15.734 kHz	-750		+750	Hz
Horizontal OSC start voltage	$f_{H\text{-st}}$				4.0	V
Increased/reduced voltage characteristic of horizontal frequency	Δf_{H-v}	$V_{11} = 12 \pm 1\text{V}, 15.734\text{ kHz at } 12\text{ V}$	-50		+50	Hz
Horizontal OSC warm-up drift	Δf_H	5 s to 30 min. after application of power	-50		+50	Hz
Temperature characteristic of horizontal frequency		$T_a = -10\text{ to } +60^\circ\text{C}$	-2.9		+2.9	Hz/ $^\circ\text{C}$
Horizontal output drive current	I_{13}		6.0		12.0	mA
Increased/reduced voltage characteristic of phase shifter delay time		$V_{11} = 12 \pm 1\text{V}$	-0.5		+0.5	%/V
Temperature characteristic of phase shifter delay time		$T_a = -10\text{ to } +60^\circ\text{C}$	-0.1		+0.1	%/ $^\circ\text{C}$
Increased/reduced voltage characteristic of phase shifter delay time		$V_{11} = 12 \pm 1\text{V}$	-1.0		+1.0	%/V
Temperature characteristic of phase shifter pulse width		$T_a = -10\text{ to } +60^\circ\text{C}$	-0.13		+0.13	%/ $^\circ\text{C}$
AFC phase comparison center time		15.734 kHz after FBP input	9.9		11.5	μs

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Parameter	Symbol	Conditions	min	typ	max	Unit
Increased/reduced voltage characteristic of AFC phase comparison center time		$V_{11} = 12 \pm 1 \text{ V}$	-1.5		+1.5	%/V
Temperature characteristic of AFC phase comparison center time		$T_a = -10 \text{ to } +60^\circ\text{C}$	-0.2		+0.2	%/°C
Comparison waveform generating input operation voltage	V_5		0.6		0.9	V
Pin 14 voltage at hold-down operation start	V_{14}		0.5		0.8	V

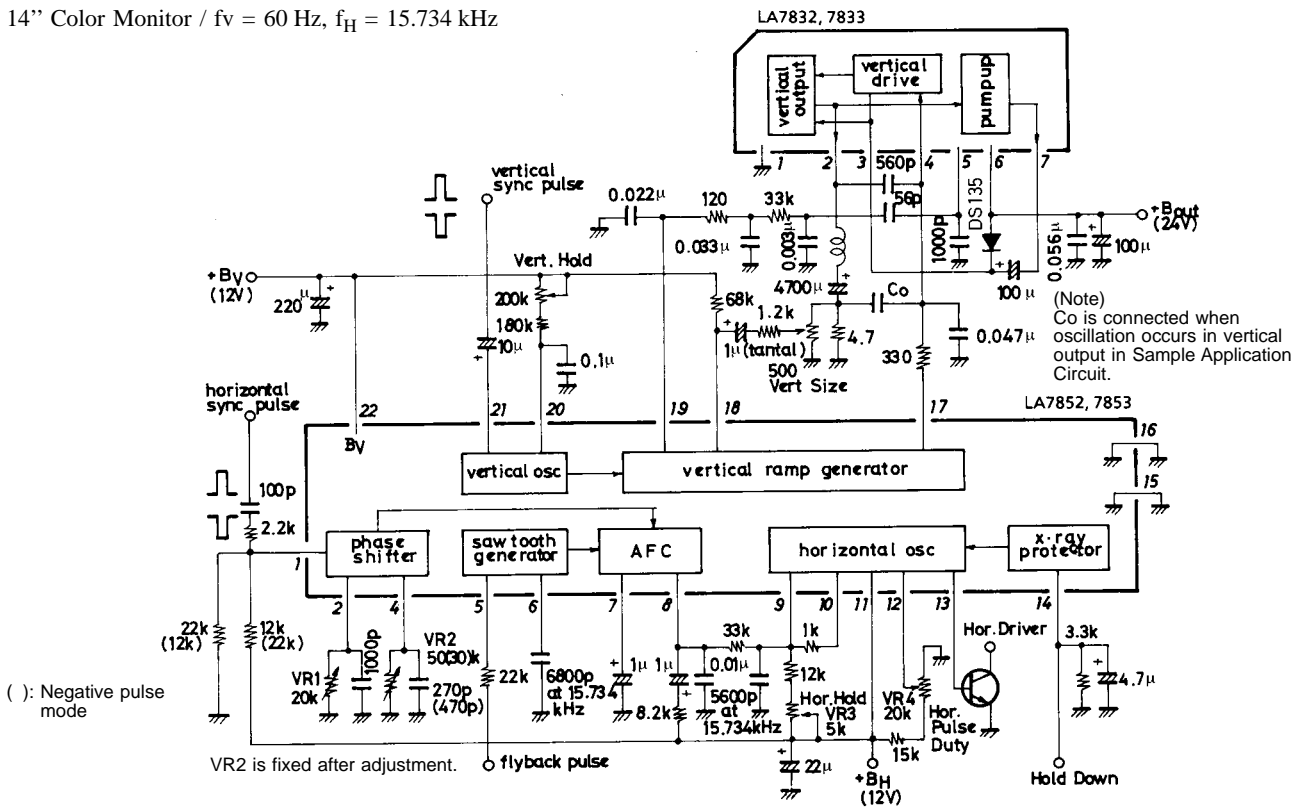
Equivalent Circuit Block Diagram



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Sample Application Circuit

14" Color Monitor / $f_v = 60 \text{ Hz}$, $f_H = 15.734 \text{ kHz}$



(): Negative pulse mode

VR2 is fixed after adjustment.

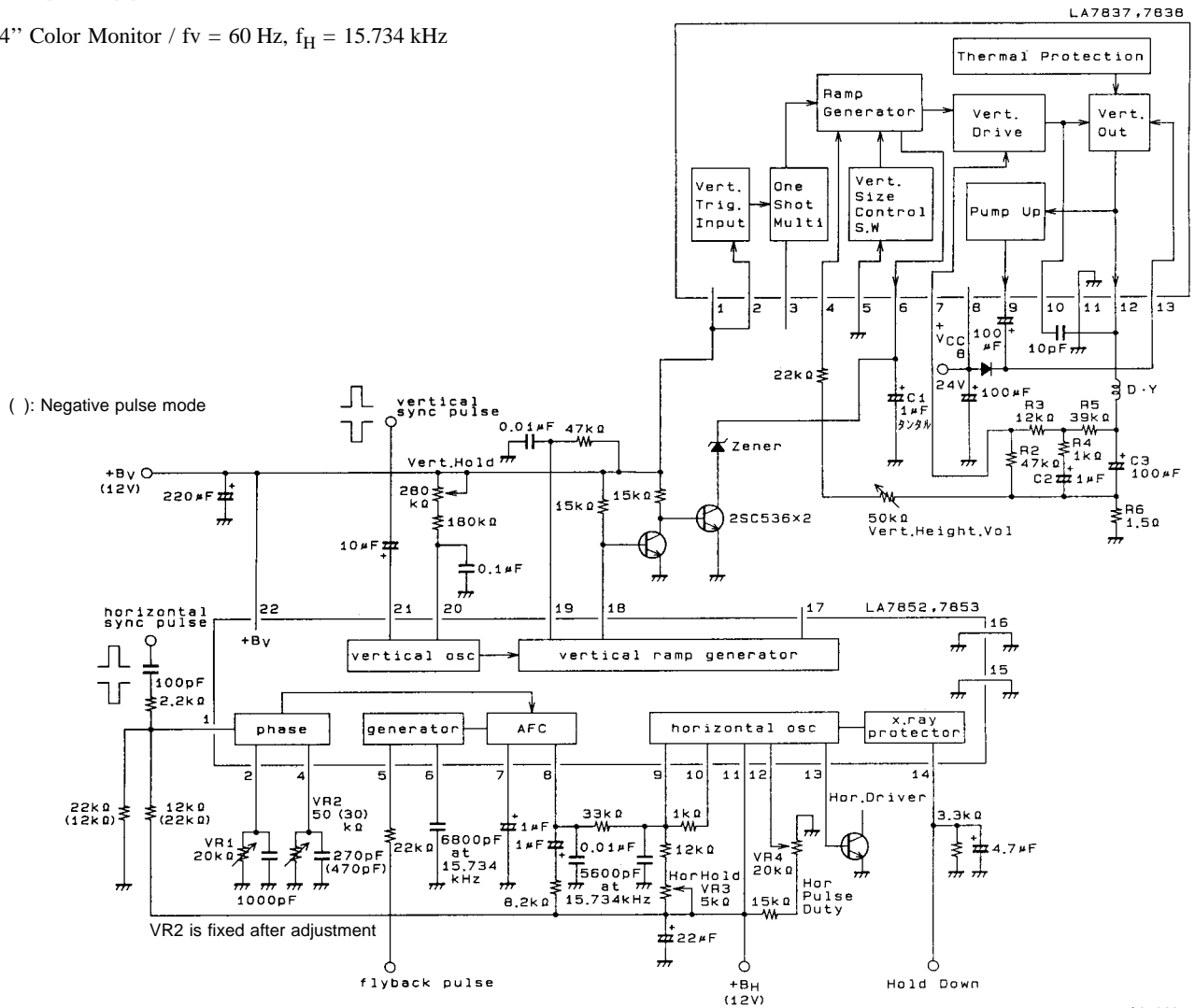
(Note) For the LA7853, the vertical pull-in range is 20 Hz at vertical sync 60 Hz.

Unit (resistance: Ω , capacitance: F)

LA7852

Sample Application Circuit

14" Color Monitor / $f_v = 60\text{ Hz}$, $f_H = 15.734\text{ kHz}$



LA7850 Family

Type Number	LA7850	LA7851	LA7852	LA7853
Package	DIP-20S (Slim Type)	DIP-20S (Slim Type)	DIP-22S (Shrink Type)	DIP-22S (Shrink Type)
Differences in characteristics	Vertical pull-in range ($f_v = 60\text{ Hz}$)	10 Hz	20 Hz	20 Hz
	Ground pin	Horizontal/vertical common	horizontal/vertical common	Horizontal/vertical separated

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