



# LA7850

## CRT Display Synchronization Deflection Circuit

### Overview

The LA7850 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 LA7850 contains these peripherals on chip and adopts a stable circuit for horizontal oscillation from 15kHz to 100kHz aiming at improving the characteristics required for CRT display use.

### Features

- The horizontal oscillation frequency can be adjusted stably from 15kHz to 100kHz.
- 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 subject to sampling control within retrace time.

### On-Chip Functions

#### [Horizontal Block]

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

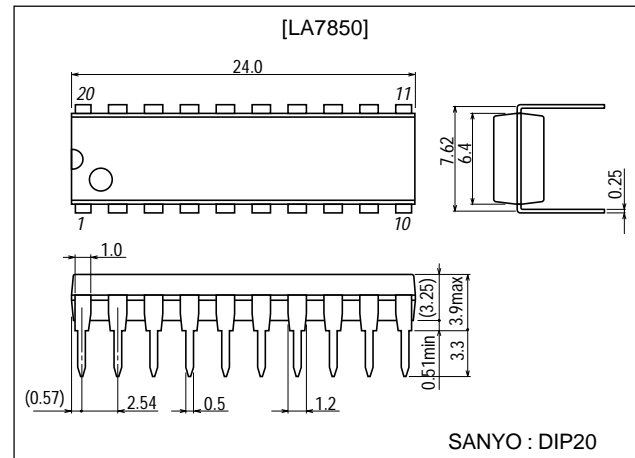
#### [Vertical Block]

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

### Package Dimensions

unit:mm

3021C-DIP20



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# LA7850

## Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{10}, V_{20} \text{ max}$		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	$V_{10}, V_{20}$		12	V
Operating voltage range	$V_{10}, V_{20}$		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

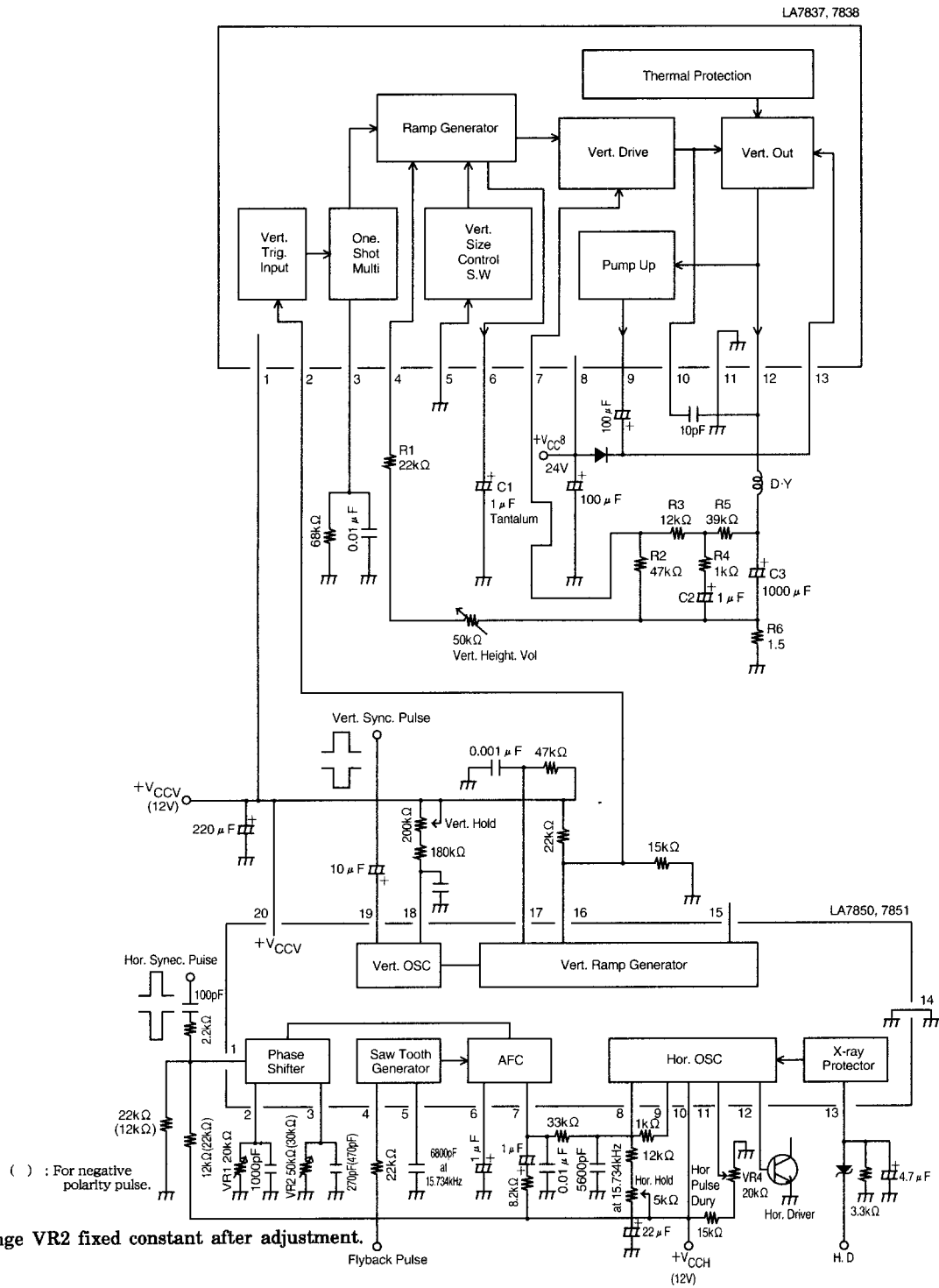
### Operating Characteristics at $T_a = 25^\circ\text{C}, V_{10}, V_{20}=12\text{V}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
$V_{CC10}$ current drain	$I_{10}$		12		30	mA
$V_{CC20}$ current drain	$I_{20}$		5		12	mA
Vertical frequency pull-in range	$V_{p \text{ in}}$	Vertical sync 60Hz	10.0		12.0	Hz
Vertical free-running frequency	$f_v$	$f_v$ center 55Hz	50		60	Hz
Increased/reduced voltage characteristic of vertical frequency	$\Delta f_{vV}$	$V_{20}=12\pm 1\text{V}, 55\text{Hz at } 12\text{V}$	-0.1		+0.1	Hz
Midpoint control threshold level			3.8		4.4	V
Vertical OSC start voltage	$f_{vst}$				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	$I_{AFC}$		$\pm 0.85$		$\pm 1.6$	mA
Horizontal free-running frequency	$f_H$	$f_H$ center 15.734kHz	-750		+750	Hz
Horizontal OSC start voltage	$f_{H \text{ st}}$				4.0	V
Increased/reduced voltage characteristic of horizontal frequency	$\Delta f_{HV}$	$V_{10}=12\pm 1\text{V}, 15.734\text{kHz at } 12\text{V}$	-50		+50	Hz
Horizontal OSC warm-up drift	$\Delta f_H$	5s. to 30min. 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	$I_{12}$		6.0		12.0	mA
Increased/reduced voltage characteristic of phase shifter delay time		$V_{10}=12\pm 1\text{V}$	-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		$V_{10}=12\pm 1\text{V}$	-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		15.734kHz after F.B.P. input	9.9		11.5	$\mu\text{s}$
Increased/reduced voltage characteristic of AFC phase comparison center time		$V_{10}=12\pm 1\text{V}$	-1.5		+1.5	%/V
Temperature characteristic of AFC comparison center time		$T_a = -10 \text{ to } +60^\circ\text{C}$	-0.2		+0.2	%/ $^\circ\text{C}$
Comparison waveform generating input operation voltage	$V_4$		0.6		0.9	V
pin 13 voltage at hold-down operation start	$V_{13}$		0.5		0.8	V



# LA7850

Sample Application Circuit : 14" Color Monitor/ $f_V=60\text{Hz}$ ,  $f_H=15.734\text{kHz}$



## LA7850 Family

Type No.	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 ( $f_V=60\text{Hz}$ )	10Hz	20Hz	10Hz
	GND pin	Hor./vert. common	Hor./vert. common	Hor./vert. separated

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