



SANYO Semiconductors

# DATA SHEET

## LA7851 — Monolithic Linear IC CRT Display Synchronization Deflection Circuit

### Overview

The LA7851 is a sync deflection circuit IC dedicated to CRT display use. It can be connected to the LA7832, 7833 (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 LA7851 contains these peripherals on chip, has a wide vertical pull-in range of 20Hz, and adopts a stable circuit for horizontal oscillation from 15kHz to 100kHz aiming at improving the characteristics required for CRT display use.

### Features

- The vertical pull-in range 20Hz permits non-adjusting at vertical sync 50Hz/60Hz.
- 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 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

■ Any and all SANYO Semiconductor Co.,Ltd. products described or contained herein are, with regard to "standard application", intended for the use as general electronics equipment (home appliances, AV equipment, communication device, office equipment, industrial equipment etc.). The products mentioned herein shall not be intended for use for any "special application" (medical equipment whose purpose is to sustain life, aerospace instrument, nuclear control device, burning appliances, transportation machine, traffic signal system, safety equipment etc.) that shall require extremely high level of reliability and can directly threaten human lives in case of failure or malfunction of the product or may cause harm to human bodies, nor shall they grant any guarantee thereof. If you should intend to use our products for applications outside the standard applications of our customer who is considering such use and/or outside the scope of our intended standard applications, please consult with us prior to the intended use. If there is no consultation or inquiry before the intended use, our customer shall be solely responsible for the use.

■ Specifications of any and all SANYO Semiconductor Co.,Ltd. products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.

**SANYO Semiconductor Co., Ltd.**

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

52808 MS JK/O2500TN (KT)/N218TA/4015MW/6114KI, TS No.1775-1/4

# LA7851

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

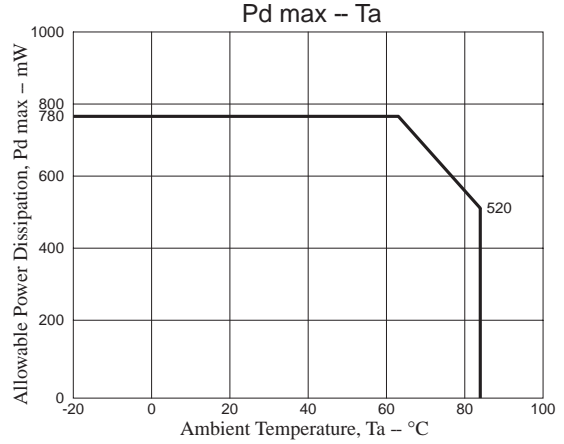
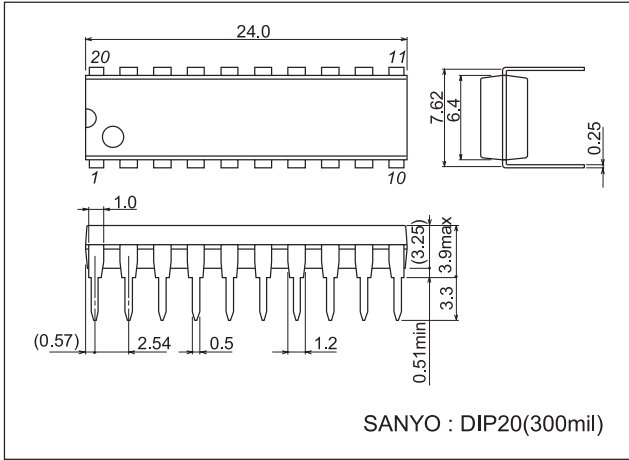
Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	$V_{10}, V_{20}$		12.0	V
Operating voltage range	$V_{10}, V_{20} \text{ op}$		9 to 13.5	V
Recommended vertical pulse input peak value	$V_{PULSE}$		5.0	Vp-p
Operating vertical pulse input peak value range	$V_{PULSE}$		2.0 to 6.0	Vp-p
Recommended horizontal pulse input peak value	$H_{PULSE}$		5.0	Vp-p
Operating horizontal pulse input peak value range	$H_{PULSE}$		2.0 to 6.0	Vp-p

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

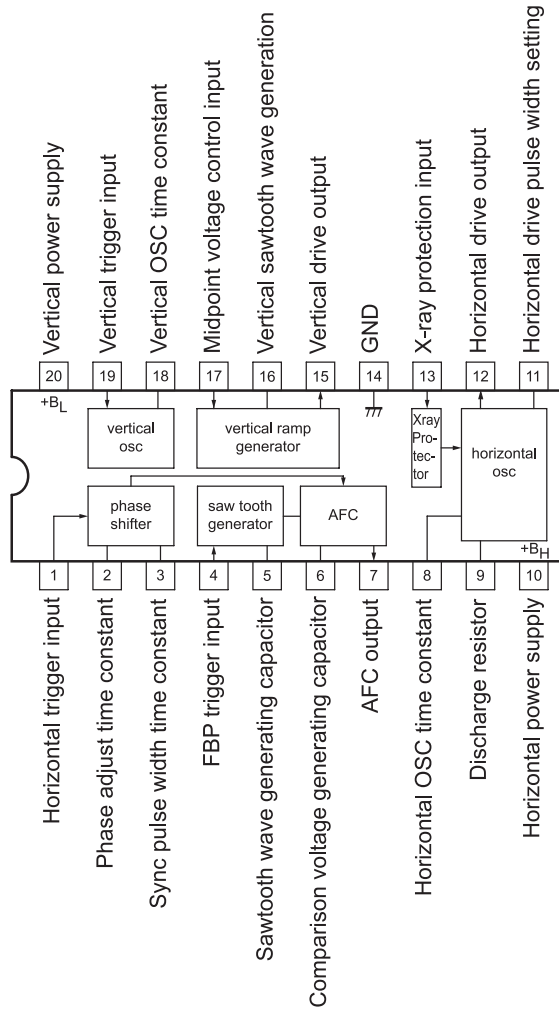
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
$V_{CC10}$ current drain	$I_{10}$		12		30	mA
$V_{CC20}$ current drain	$I_{20}$		5		12	mA
Vertical frequency pull-in range	$V_{P \text{ IN}}$	Vertical sync 60Hz	21.0		23.0	Hz
Vertical free-running frequency	$f_V$	$f_V$ center 55Hz	50		60	Hz
Increased/reduced voltage characteristic of vertical frequency	$\Delta f_{VV}$	$V_{22} = 12 \pm 1\text{V}$ , 55Hz at 12V	-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		$T_a = -10$ 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	$\Delta f_{H, V}$	$V_{11} = 12 \pm 1\text{V}$ , 15.734kHz at 12V	-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		$T_a = -10$ 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		$T_a = -10$ 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		$T_a = -10$ 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 phase comparison center time		$T_a = -10$ 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

Package Dimensions

unit : mm (typ)  
3021C

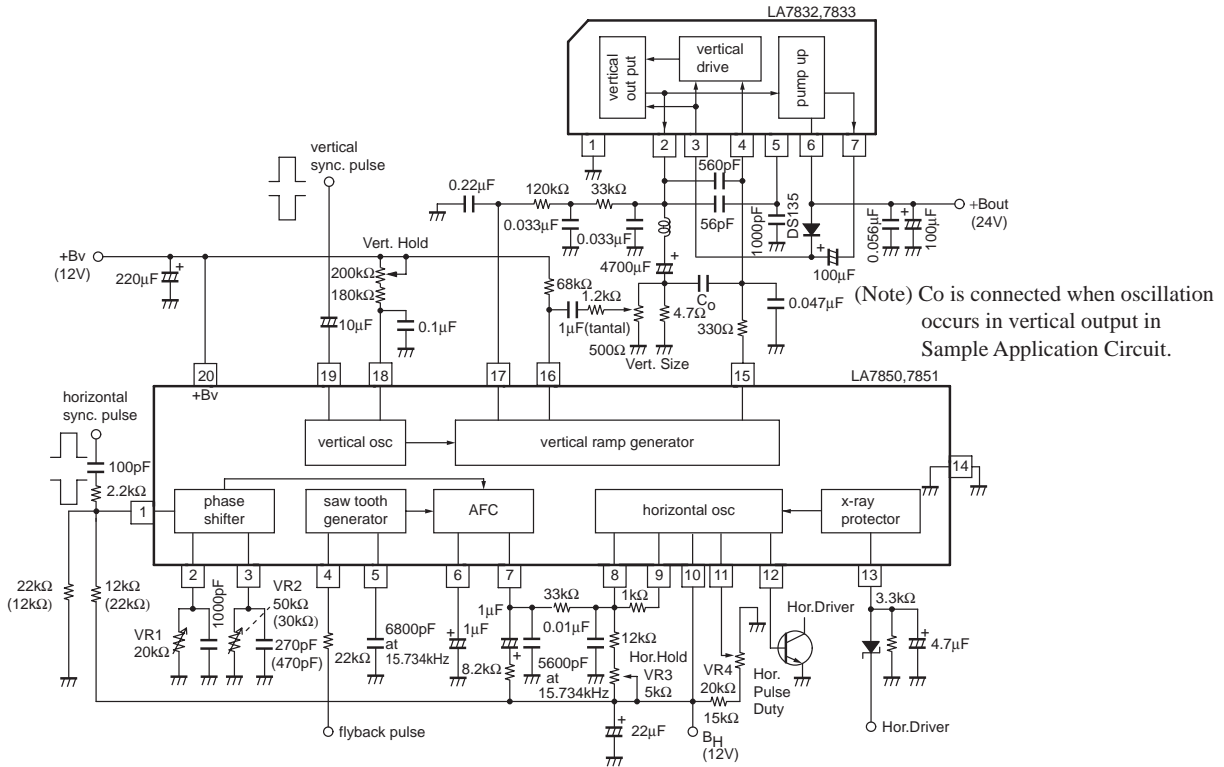


Block Diagram



# LA7851

## 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 LA7350, the vertical pull-in range is 10Hz at vertical sync 60Hz.

- SANYO Semiconductor Co.,Ltd. assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all SANYO Semiconductor Co.,Ltd. products described or contained herein.
- SANYO Semiconductor Co.,Ltd. strives to supply high-quality high-reliability products, however, any and all semiconductor products fail or malfunction with some probability. It is possible that these probabilistic failures or malfunction could give rise to accidents or events that could endanger human lives, trouble that could give rise to smoke or fire, or accidents that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all SANYO Semiconductor Co.,Ltd. products described or contained herein are controlled under any of applicable local export control laws and regulations, such products may require the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written consent of SANYO Semiconductor Co.,Ltd.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the SANYO Semiconductor Co.,Ltd. product that you intend to use.
- Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production.
- Upon using the technical information or products described herein, neither warranty nor license shall be granted with regard to intellectual property rights or any other rights of SANYO Semiconductor Co.,Ltd. or any third party. SANYO Semiconductor Co.,Ltd. shall not be liable for any claim or suits with regard to a third party's intellectual property rights which has resulted from the use of the technical information and products mentioned above.

This catalog provides information as of May, 2008. Specifications and information herein are subject to change without notice.