Ordering number : EN1775B

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

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Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{10}, V_{20} max		14	V
Allowable power dissipation	Pd max	Ta ≤ 65°C	780	mW
Operating temperature	Topr		–20 to +85	°C
Storage temperature	Tstg		–55 to +125	°C

Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{10}, V_{20}		12.0	V
Operating voltage range	V_{10}, V_{20} 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

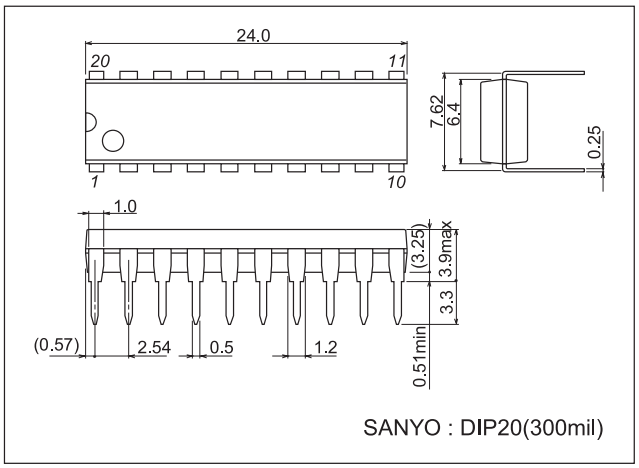
Electrical Characteristics at Ta = 25°C, V_{11}, V_{22} = 12V

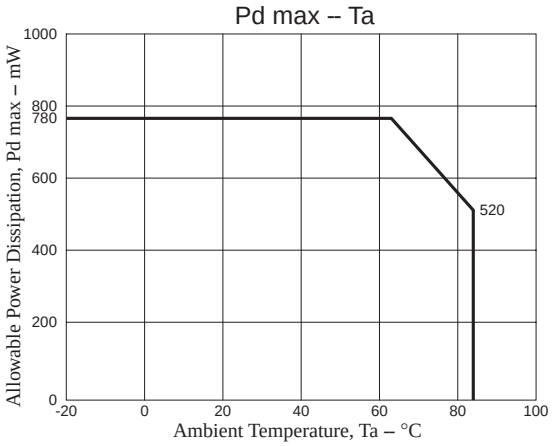
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
V_{CC10} current drain	I_{10}		12		30	mA
V_{CC20} current drain	I_{20}		5		12	mA
Vertical frequency pull-in range	$V_{P\ IN}$	Vertical sync 60Hz	21.0		23.0	Hz
Vertical free-running frequency	f_V	f_V center 55Hz	50		60	Hz
Increased/reduced voltage characteristic of vertical frequency	Δf_{VV}	V_{22} = 12±1V, 55Hz at 12V	–0.1		+0.1	Hz
Midpoint control threshold level			3.8		4.4	V
Vertical OSC start voltage	$f_{V,\ st}$				4.0	V
Temparature characteristic of vertical frequency		Ta = –10 to +60°C	–0.028		+0.028	Hz/°C
Vertical driver amplification factor	G_V		12		18	dB
Horizontal AFC DC loop gain	I_{AFC}		±0.85		±1.6	mA
Horizontal free-running frequency	f_H	f_H center 15.734kHz	–750		+750	Hz
Horizontal OSC start voltage	$f_{H,\ st}$				4.0	V
Increased/reduced voltage characteristic of horizontal frequency	$\Delta f_{H,\ V}$	V_{11} = 12±1V, 15.734kHz at 12V	–50		+50	Hz
Horizontal OSC warm-up drift	Δf_H	5s. to 30min. after application of power	–50		+50	Hz
Temperature characteristic of horizontal frequency		Ta = –10 to +60°C	–2.9		+2.9	Hz/°C
Horizontal output drive current	I_{12}		6.0		12.0	mA
Increased/reduced voltage characteristic of phase shifter delay time		V_{10} = 12±1V	–0.5		+0.5	%/V
Temperature characteristic of phase shifter delay time		Ta = –10 to +60°C	–0.1		+0.1	%/°C
Increased/reduced voltage characteristic of phase shifter delay time		V_{10} = 12±1V	–1.0		+1.0	%/V
Temperature characteristic of phase shifter pulse width		Ta = –10 to +60°C	–0.13		+0.13	%/°C
AFC phase comparison center time		15.734kHz after F.B.P. input	9.9		11.5	μs
Increased/reduced voltage characteristic of AFC phase comparison center time		V_{10} = 12±1V	–1.5		+1.5	%/V
Temperature characteristic of AFC phase comparison center time		Ta = –10 to +60°C	–0.2		+0.2	%/°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

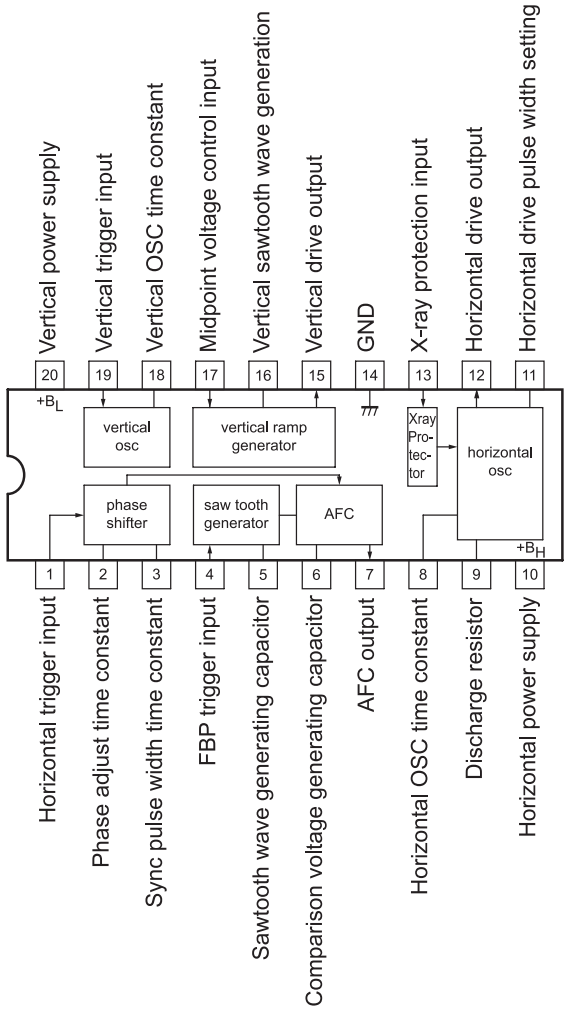
unit : mm (typ)

3021C

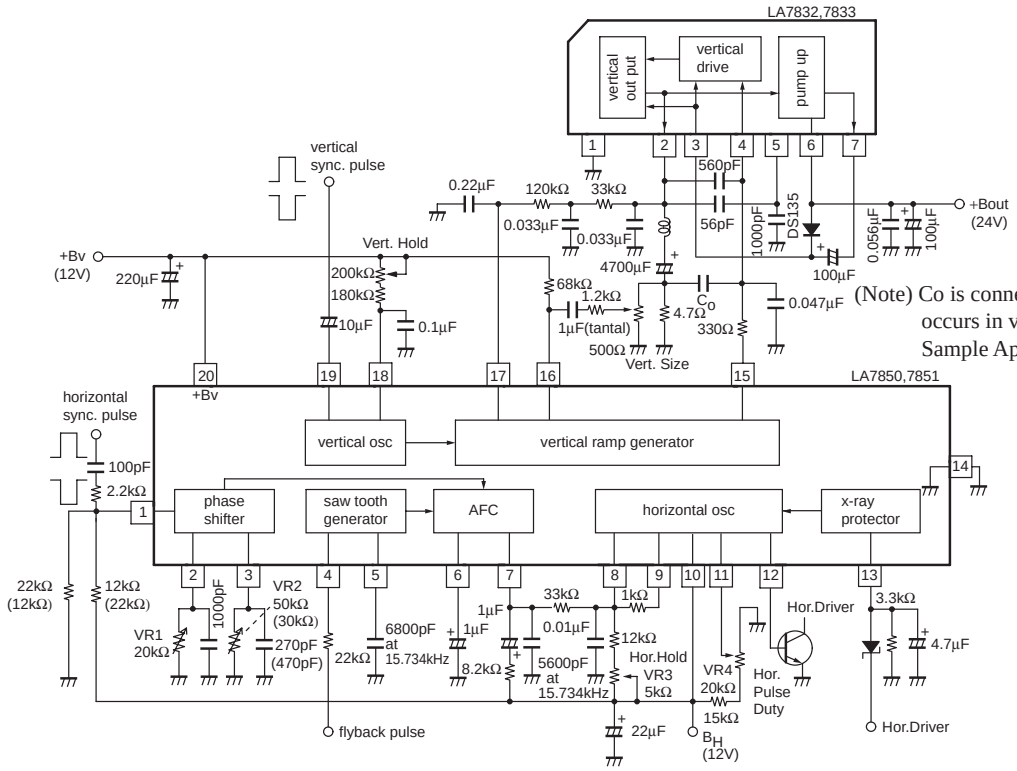




Block Diagram



Sample Application Circuit: 14"Color Monitor/f_V = 60Hz, f_H = 15.734kHz



( ) : Negative pulse mode

VR2 is fixed after adjustment.

(Note) For the LA7350, the vertical pull-in range is 10Hz at vertical sync 60Hz.