

**LA7835**

## Vertical Deflection Output Circuit with Driver for Color TV Use

## Overview

The LA7835 is an IC that contains the vertical deflection output circuit with a driver for small-aperture (maximum deflection current 1.8Ap-p) color/B&W TV, monitor/display use and is placed in a SIP13H package. The LA7835 has such features as greatly reduced number of external parts and low power dissipation. Since both DC feedback and AC feedback can be provided inside the IC, it is easy to design the vertical deflection circuit. The LA7835 can be used in conjunction with single-chip IC LA7650 (NTSC), LA7680 series (PAL/NTSC) (VIF, SIF, video, chroma, and deflection circuit) to provide all the functions required for color TV signal processing.

## Features

- Low power dissipation because of on-chip pump-up circuit.
- On-chip 50/60Hz vertical size control circuit.
- On-chip ramp generator.
- On-chip driver circuit.
- Vertical output circuit.
- On-chip thermal protection circuit.
- Minimum number of parts required.

## Specifications

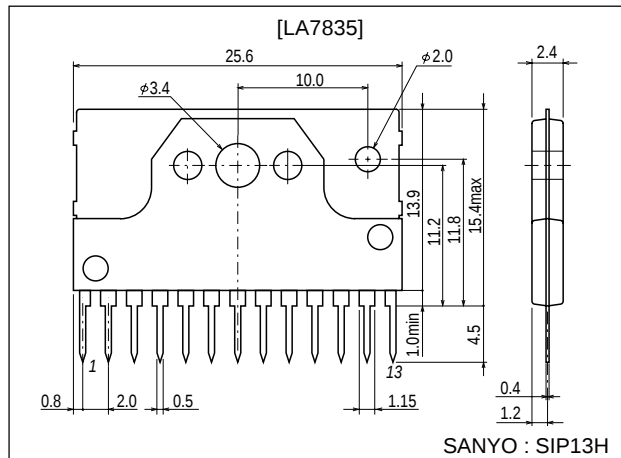
### Maximum Ratings at $T_a = 25^\circ\text{C}$

| Parameter                    | Symbol                 | Conditions              | Ratings      | Unit |
|------------------------------|------------------------|-------------------------|--------------|------|
| Driver power supply voltage  | +V <sub>CC1</sub> max  |                         | 15           | V    |
| Pump-up power supply voltage | +V <sub>CC7</sub> max  |                         | 30           | V    |
| Output power supply voltage  | +V <sub>CC12</sub> max |                         | 62           | V    |
| Deflection output current    | I <sub>DEF</sub>       |                         | −1.5 to +1.5 | Ap-o |
| Allowable power dissipation  | P <sub>d</sub> max     | With infinite heat sink | 8            | W    |
| Operating temperature        | T <sub>opr</sub>       |                         | −20 to +85   | °C   |
| Storage temperature          | T <sub>stg</sub>       |                         | −40 to +150  | °C   |
| Thermal resistance           | θ <sub>j-c</sub>       |                         | 4            | °C/W |

## Package Dimensions

unit:mm

3107-SIP13H



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**SANYO Electric Co.,Ltd. Semiconductor Company**

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

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## Operating Supply Voltage Conditions

| Parameter              | Symbol     | Conditions | Ratings  | Unit |
|------------------------|------------|------------|----------|------|
| Driver supply voltage  | $+V_{CC1}$ |            | 8 to 14  | V    |
| Pump-up supply voltage | $+V_{CC7}$ |            | 10 to 27 | V    |

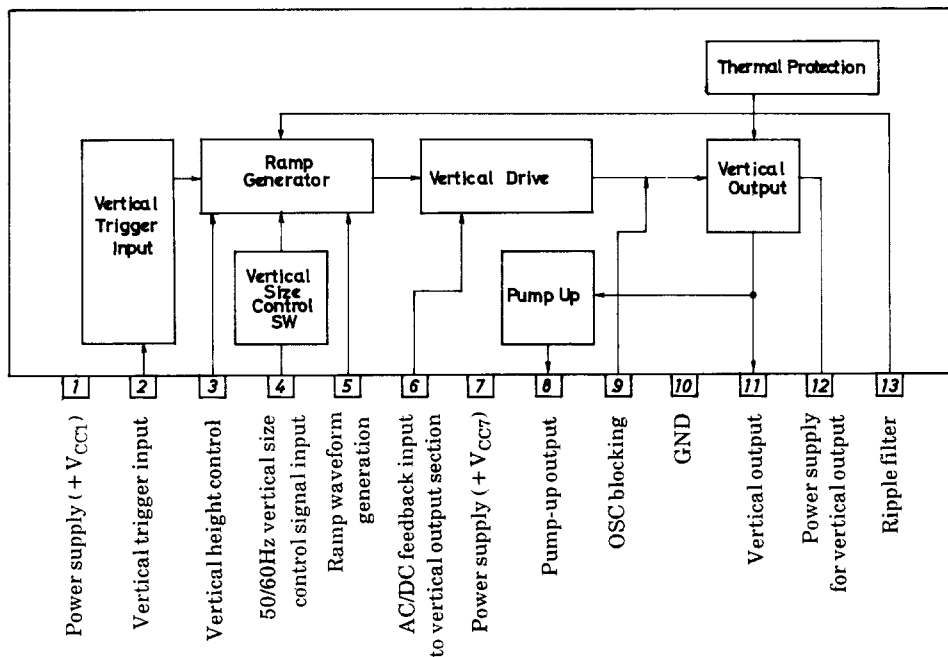
## Recommended Operating Conditions

| Parameter                 | Symbol      | Conditions | Ratings   | Unit |
|---------------------------|-------------|------------|-----------|------|
| Driver supply voltage     | $+V_{CC1}$  |            | (9) 12    | V    |
| Pump-up supply voltage    | $+V_{CC7}$  |            | 24        | V    |
| Deflection output current | $I_{11p-p}$ |            | up to 1.8 | Ap-p |

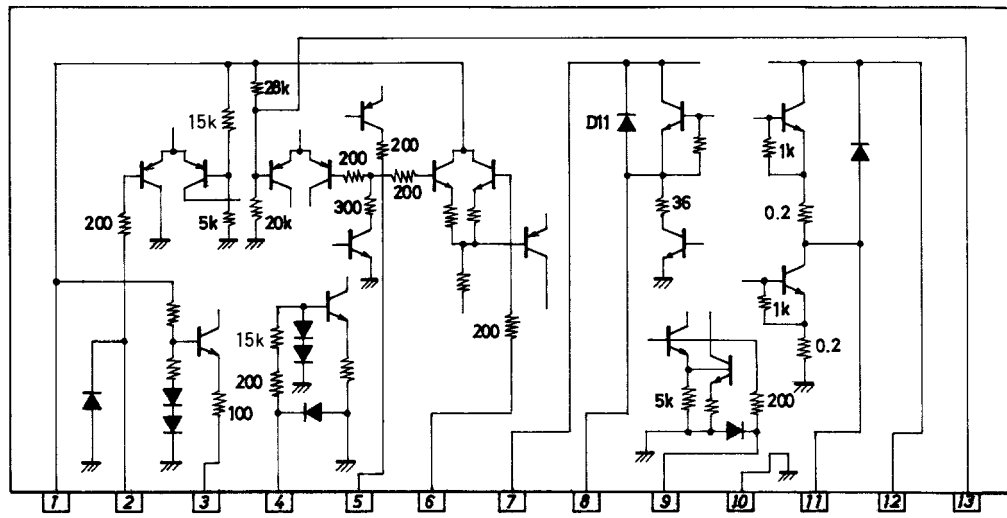
## Operating Characteristics at $T_a = 25^\circ\text{C}$ , $+V_{CC1}=12\text{V}$ , $+V_{CC7}=24\text{V}$

| Parameter                                    | Symbol       | Conditions      | Ratings |     |     | Unit |
|----------------------------------------------|--------------|-----------------|---------|-----|-----|------|
|                                              |              |                 | min     | typ | max |      |
| Driver power supply quiescent current        | $I_{CC1}$    |                 | 1.8     | 2.8 | 3.8 | mA   |
| Trigger input threshold voltage              | $V_2$        |                 | 2.8     | 3.1 | 3.4 | V    |
| Vertical size control pin voltage            | $V_3$        |                 | 5.9     | 6.1 | 6.3 | V    |
| Ramp waveform shape start voltage            | $V_{RAMP}$   |                 | 4.7     | 5.0 | 5.3 | V    |
| Pump-up charge saturation voltage            | $V_{S8-10}$  |                 |         |     | 1.5 | V    |
| Pump-up discharge saturation voltage         | $V_{S7-8}$   | $I=0.9\text{A}$ |         |     | 3.0 | V    |
| Deflection output saturation voltage (lower) | $V_{S11-10}$ | $I=0.9\text{A}$ |         |     | 1.2 | V    |
| Deflection output saturation voltage (upper) | $V_{S12-11}$ | $I=0.9\text{A}$ |         |     | 3.2 | V    |
| Idling current                               |              |                 | 16      | 22  | 32  | mA   |
| Voltage gain                                 | $V_{GO}$     | $f=1\text{kHz}$ |         | 59  |     | dB   |

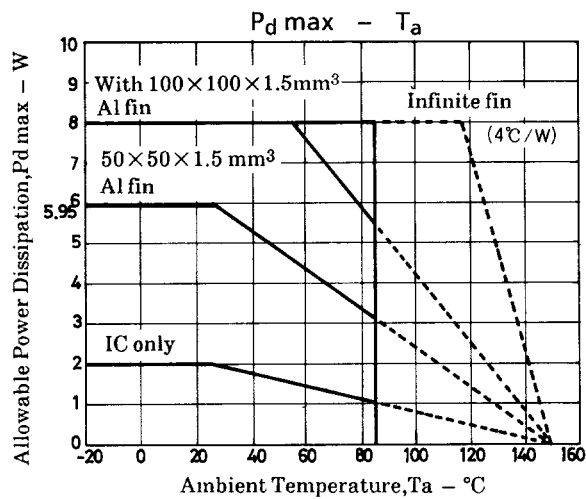
## Pin Assignment and Block Diagram



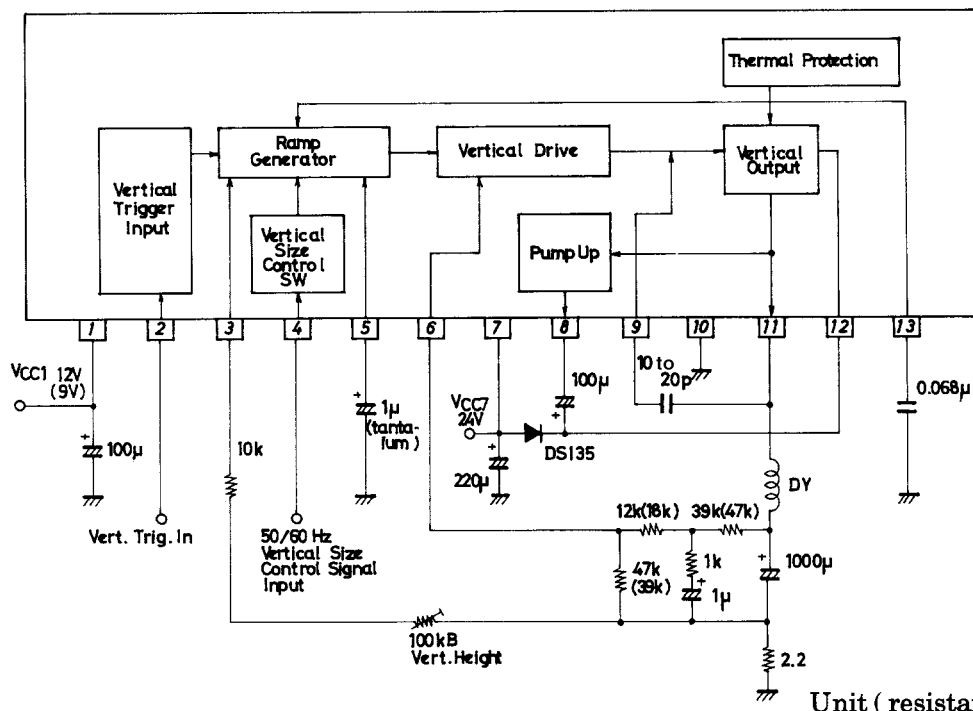
# Equivalent Circuit



Unit ( resistance:Ω, capacitance:F )



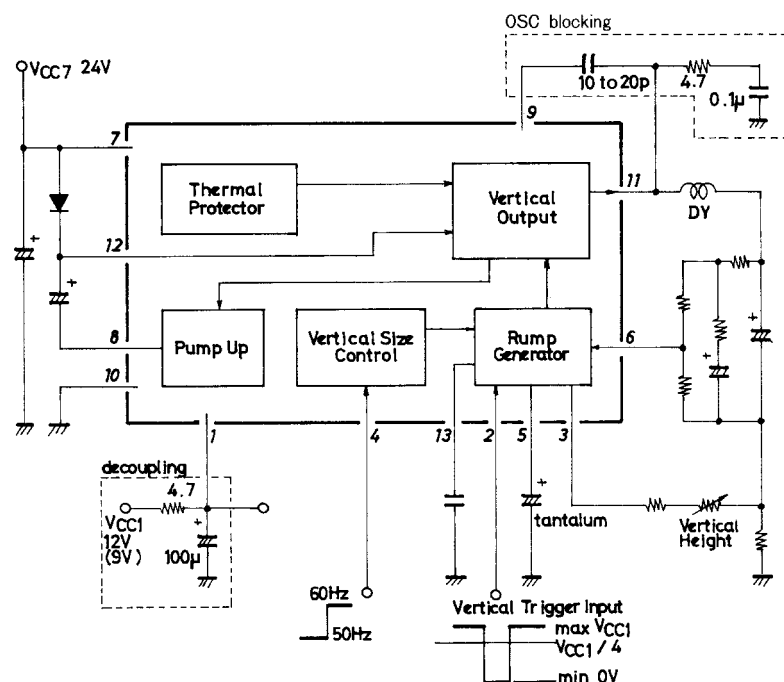
# Sample Application Circuit



Unit ( resistance:Ω, capacitance:F )

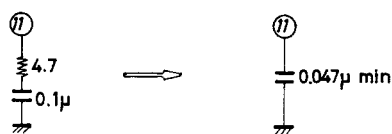
Note) The values in parentheses are for a sample application where the  $V_{CC1}$  is 9V.

## Proper Cares in Using the LA7835



Unit ( resistance:Ω, capacitance:F )

- Note 1) If horizontal components are mixed into pin 1, causing the interlace characteristic to worsen, provide decoupling as shown above. The resistor value and capacitor value are shown as an example.
- 2) If oscillation occurs, connect the OSC blocking circuit as shown above. However, if the deflection current increases, oscillation may not be blocked completely. In this case, change the application circuit as shown below.



- 3) In some applications, the OSC blocking capacitor across pins 9 and 11 is connected across pin 9 and GND.
- 4) The threshold voltage on pin 2 is  $+V_{CC1}/4$ . Set the input trigger level so that it intersects this threshold level. The LA7835 operates on the negative transition of the trigger pulse.
- 5) Connect the radiator fin to GND.

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