

SANYO

No. 3936 A.

LA7375**Recording and Playback Amplifier
for VHS Video Recorders****Overview**

The LA7375 is a recording and playback amplifier for VHS-format video tape recorders. It features a two-channel playback amplifier and a single-channel recording amplifier, making it ideal for standard-play mode recorders.

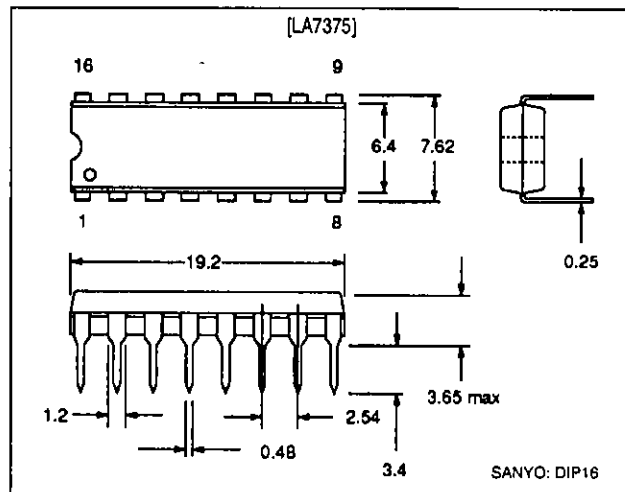
The LA7375 operates from a 5V supply and is available in 16-pin DIPs.

Features

- Two-channel playback amplifier
- Single-channel recording amplifier
- RF envelope detector for automatic tracking
- Constant-current output, high stability recording amplifier
- Automatic gain control
- 5V supply
- 16-pin DIP

Package Dimensions

Unit: mm

3006B-DIP16

Specifications

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

| Parameter | Symbol | Conditions | Ratings | Unit |
|-----------------------------|-----------|--------------------------|-------------|------------------|
| Maximum supply voltage | V_{CC} | | 7 | V |
| Allowable power dissipation | P_D max | $T_a = 65^\circ\text{C}$ | 650 | mW |
| Operating temperature | T_{opr} | | -10 to +65 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | | -40 to +150 | $^\circ\text{C}$ |

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

| Parameter | Symbol | Conditions | Ratings | Unit |
|----------------------|--------------|------------|-------------|------|
| Supply voltage | V_{CC} | | 5 | V |
| Supply voltage range | $V_{CC\ op}$ | | 4.75 to 5.5 | V |

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

Playback Mode with SW3 = OFF

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--|------------------|--|---------|------|------|---------------|
| | | | min | typ | max | |
| Supply current | I_{CCP} | | 23 | 28 | 33 | mA |
| Channel 1 voltage gain | G_{VP1} | $V_i = 38\text{mVp-p}, f = 1\text{MHz}$ | 57 | 60 | 63 | dB |
| Channel 2 voltage gain | G_{VP2} | | 57 | 60 | 63 | dB |
| Gain differential | ΔG_{VP} | $G_{VP1} - G_{VP2}$ | -1 | 0 | +1 | dB |
| Input conversion rms noise voltage | V_{NI} | 1.1MHz lowpass filter | - | 1.1 | 1.5 | μV |
| Frequency response | ΔV_{FP} | $V_i = 38\text{mVp-p}, f = 1$ to 7MHz | -3.5 | 0 | - | dB |
| Second-harmonic distortion | V_{HDP} | $V_i = 38\text{mVp-p}, f = 4\text{MHz}$ | - | -40 | -35 | dB |
| Maximum output level | V_{OMP} | $f = 1\text{kHz}, -30\text{dB}$ harmonic distortion | 0.8 | 1.0 | - | Vp-p |
| Crosstalk | V_{CR} | $V_i = 38\text{mVp-p}, f = 4\text{MHz}, 8.2\mu\text{H}$ input inductor short-circuited | - | -40 | -35 | dB |
| Output DC offset voltage between channels | ΔV_{ODC} | | -350 | 0 | +350 | mV |
| AGC input level | ΔAGC | $f = 4\text{MHz}, TP4 = 250\text{mVp-p}$ | 300 | 330 | 360 | mVp-p |
| AGC second-harmonic distortion | V_{HDAGC} | $V_i = 38\text{mVp-p}, f = 4\text{MHz}$ | - | -40 | -35 | dB |
| AGC control level | V_{AGC} | $f = 4\text{MHz}, T4 = 500\text{mVp-p}$ | - | 1.0 | 1.5 | dB |
| | | $f = 4\text{MHz}, T4 = 125\text{mVp-p}$ | -1.2 | -0.7 | - | |
| Envelope detector quiescent output voltage | V_{ENVQ} | T12 quiescent, no input | 0.47 | 0.52 | 0.57 | V |
| Envelope detector output | V_{ENV} | $f = 4\text{MHz}, T4 = 300\text{mVp-p}$ | 2.0 | 2.25 | 2.5 | V |
| | | $f = 4\text{MHz}, T4 = 500\text{mVp-p}$ | 2.9 | 3.2 | 3.5 | |
| | | $f = 3\text{MHz}, T4 = 300\text{mVp-p}$ | 1.65 | 1.9 | 2.15 | |
| | | $f = 5\text{MHz}, T4 = 300\text{mVp-p}$ | 2.0 | 2.3 | 2.6 | |
| Playback-ON switch ON resistance | R_{PON} | Measured with 1mA and 2mA DC inputs. | - | 6 | 10 | Ω |
| SW1 threshold level | SW_{RF1} | Channel 1 to 2 | 1.2 | - | 1.8 | V |
| | | Channel 2 to 1 | 0 | - | 0.8 | |
| SW2 threshold level | SW_{RF2} | Channel 1 to 2 | 3.2 | - | 4.0 | V |
| | | Channel 2 to 1 | 2.2 | - | 2.8 | |

Recording Mode with SW3 = ON

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|--|-----------------|---|---------|------|------|-------|
| | | | min | typ | max | |
| Supply current | I_{CCR} | | 50 | 55 | 60 | mA |
| Voltage gain | G_{VR} | $V_i = 150\text{mVp-p}$, $f = 4\text{MHz}$ | -3.5 | -1.5 | +0.5 | dB |
| Frequency response | ΔV_{FR} | $V_i = 150\text{mVp-p}$, $f = 1$ to 7MHz | -2 | 0 | - | dB |
| Second-harmonic distortion | V_{HDR} | $f = 4\text{MHz}$, $V_o = 15\text{mVp-p}$ | - | -45 | -40 | dB |
| Maximum output level | V_{OMP} | $f = 4\text{MHz}$, -40dB harmonic distortion | 15 | 20 | - | mVp-p |
| Muting attenuation | V_{MR} | $V_i = 150\text{mVp-p}$, $f = 4\text{MHz}$ | - | -45 | -40 | dB |
| Intermodulation distortion | V_{CY} | $f_{(T8Y)} = 4\text{MHz}$, $f_{(T8C)} = 629\text{kHz}$, $T15A = 150\text{mVp-p}$, $T15 = 40\text{mVp-p}$ | - | -45 | -40 | dB |
| Luminance and chrominance mixer voltage gain | G_{MIX} | $V_i = 150\text{mVp-p}$, $f = 4\text{MHz}$ | 9 | 11 | 13 | dB |
| REC switch threshold level | SW_{REC} | | 3.9 | - | 5.0 | V |
| REC MUTE threshold level | SW_{MUTE} | | 2.2 | - | 4.0 | V |

Measurement Conditions

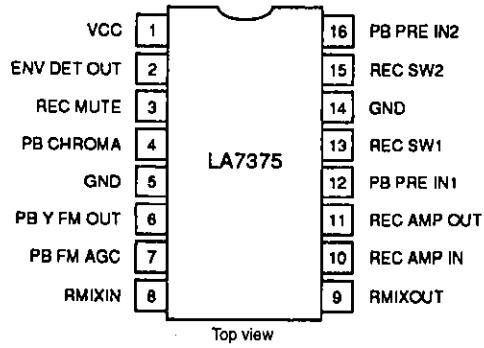
Playback Mode

| Parameter | Channel | Test points | | Switch positions | |
|---|---------|-------------|--------|------------------|------|
| | | Input | Output | SW30 | Mute |
| Supply current | | T1 | | 1 | |
| Voltage gain, frequency response, harmonic distortion, output level and crosstalk | 1 | T16 | T4 | 1 | |
| | 2 | T12 | T4 | 2 | |
| Input conversion rms noise level | 1, 2 | | T4 | 1 | |
| Output DC offset | | PB CHROMA | | 1 to 2 | |
| AGC input level, AGC harmonic distortion and AGC control voltage | | T16 | T6 | 1 | |
| Envelope detector quiescent current | | | T2 | 1 | |
| Envelope detector output voltages | | T16 | T2 | 1 | |
| Playback-ON switch ON resistance | | | T11 | | |
| RF SW1 threshold | | T3 | | | 1 |
| RF SW2 threshold | | T3 | | | 2 |

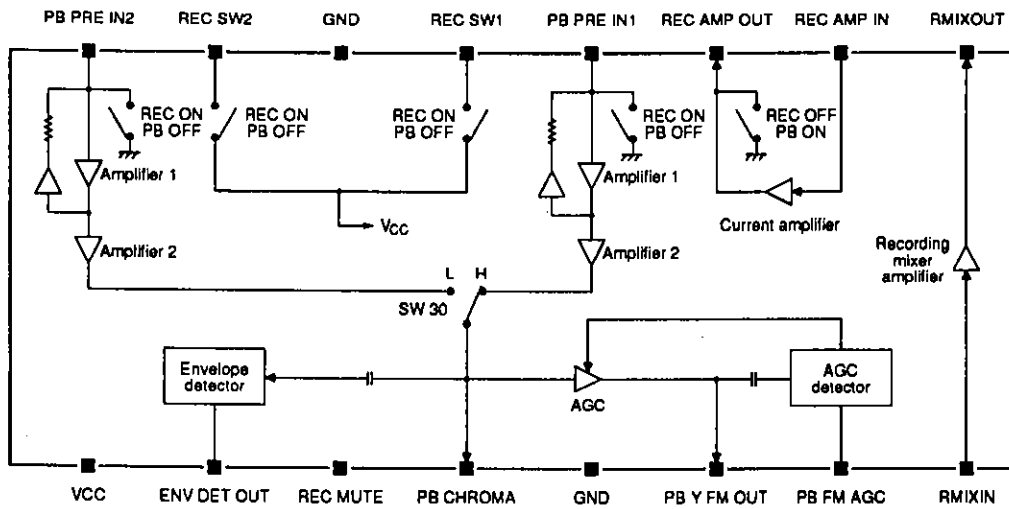
Recording Mode

| Parameter | Test points | | Switch positions | |
|--|-------------|-----------|------------------|------|
| | Input | Output | SW30 | Mute |
| Supply current | T1 | | | 1 |
| Voltage gain, frequency response, harmonic distortion and output level | T8Y | T15A, T15 | | 1 |
| Muting attenuation | T8Y | T15A, T15 | | 2 |
| Intermodulation distortion | T8Y, T8C | T15A, T15 | | 1 |
| Luminance and chrominance mixer gain | T8Y | T9 | | 1 |
| REC switch threshold | T3 | | | 1 |
| REC MUTE switch threshold | T3 | | | 2 |

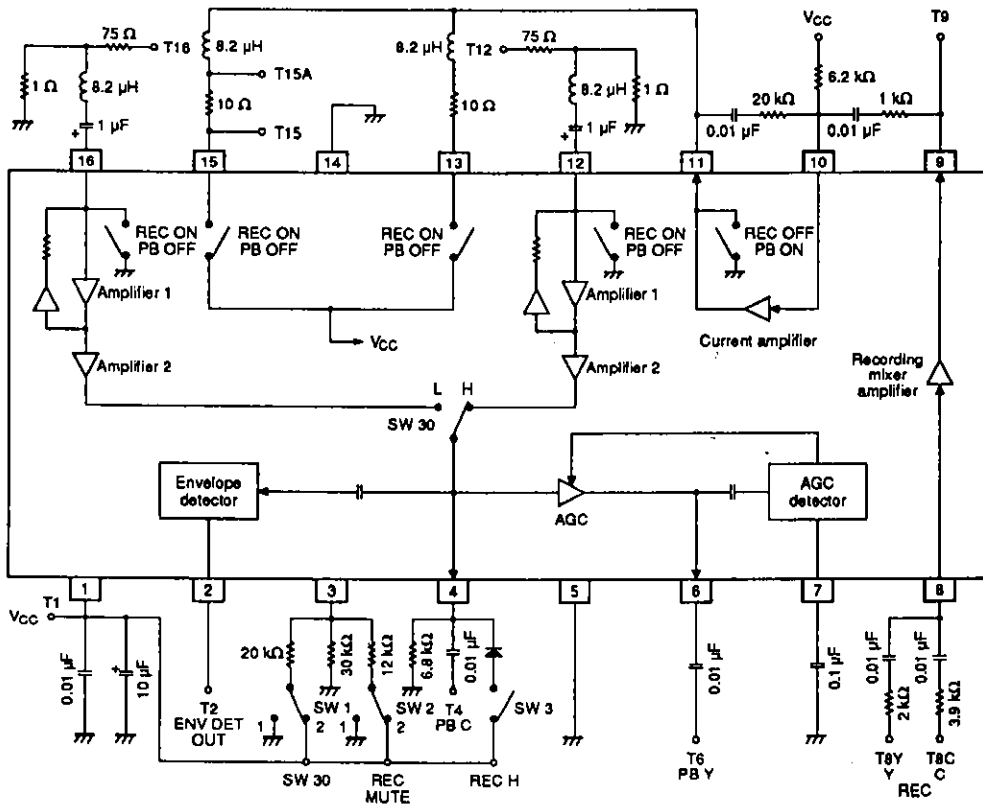
Pin Assignment



Block Diagram

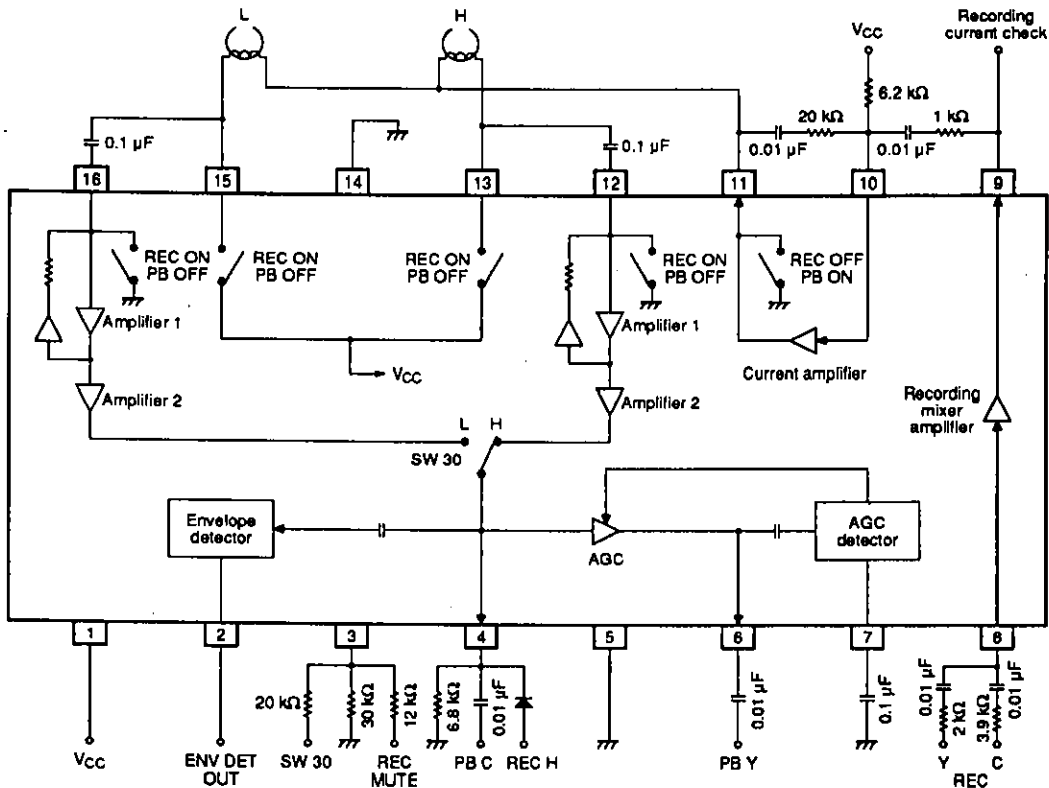


AC Measurement Circuit



Note that the SW30 switch is in the L position when the voltage on pin 3 is 0 to 1V (muting OFF) or 2 to 3V (muting ON), and in the H position when the voltage on pin 3 is 1 to 2V (muting OFF) or 3 to 4V (muting ON).

Typical Application



Pin Functions

| Number | Name | Equivalent circuit | Function |
|--------|-------------|--------------------|--|
| 1 | VCC | | 5V supply |
| 2 | ENV DET OUT | | Playback-mode envelope detector output. Nominal voltages are 0.5V (PB with no signal) and 0V (REC). |
| 3 | REC MUTE | | Muting control and playback SW30 switch control input |
| 4 | PB CHROMA | | Playback chrominance output. Nominal voltages are 2.0V (PB) and > 3.8V (REC). |
| 5 | GND | | Ground |
| 6 | PB Y FM OUT | | Luminance FM output. Nominal voltages are 2.5V (PB) and 4.0V (REC). |
| 7 | PB FM AGC | | Playback AGC detector output. Nominal voltages are 1.5V (PB) and 0V (REC). |
| 8 | RMIXIN | | Recording-mode mixer amplifier input. Nominal voltages are 2.1V (PB) and 1.65V (REC). Gain is 11dB when R is 2kΩ, and 6dB when R is 3.9kΩ. |
| 9 | RMIXOUT | | Recording-mode mixer amplifier output. Nominal voltages are 4.1V (PB) and 1.8V (REC). |

LA7375

| Number | Name | Equivalent circuit | Function |
|--------|-------------|--------------------|---|
| 10 | REC AMP IN | | Recording-mode current amplifier input. Nominal voltages are 1.77V (PB) and 1.85V (REC). |
| 11 | REC AMP OUT | | Recording-mode current amplifier output. Nominal voltages are 0V (PB) and 4.2V (REC). Switching transistor ON resistance is 5Ω. |
| 12 | PB PRE IN1 | | Playback-mode preamplifier input. Nominal voltages are 0.7V (PB) and 0V (REC). Low-noise input transistor. |
| 13 | REC SW1 | | Recording-mode switches. Nominal voltages are 0V (PB) and 4.2V (REC). |
| 15 | REC SW2 | | |
| 14 | GND | | Preamplifier ground |
| 16 | PB PRE IN2 | | Playback-mode preamplifier input. Nominal voltages are 0.7V (PB) and 0V (REC). Low-noise input transistor. |

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