



SANYO Semiconductors

## DATA SHEET



LA2616V

Monolithic Linear IC  
Featuring the AViSS 3D Surround Algorithm  
Analog Surround IC

## Overview

The LA2616V is sound field playback processing ICs for use in audio equipment, TVs, and PCs.

These ICs allow equipment to easily reproduce a spatial realistic sound field from a stereo signal from a music, video, or other audio source.

## Features

- Supports a wide operating supply voltage range, and can be used in a wide range of applications.
- The added surround signal level can be adjusted.
- Low-noise low-distortion bypass mode
- Provides a natural feeling of spaciousness without degrading the tonal coloration of the source.
- Clear vocal positioning without any apparent loss of center to the sound
- Miniature packages : SSOP16

## Functions

- Surround signal processing
- Surround/bypass switching
- Variable surround effect
- LED drive circuit

## Specifications

Maximum Ratings at Ta = 25°C

| Parameter                   | Symbol              | Conditions  | Ratings     | Unit |
|-----------------------------|---------------------|-------------|-------------|------|
| Maximum supply voltage      | V <sub>CC max</sub> |             | 13          | V    |
| Allowable power dissipation | Pd max              | Ta ≤ 70°C * | 250         | mW   |
| Operating temperature       | Topr                |             | -25 to +70  | °C   |
| Storage temperature         | Tstg                |             | -40 to +125 | °C   |

\*Mounted on a specified board : 114.3mm × 76.1mm × 1.6mm, glass epoxy board.

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## Operating Conditions at Ta = 25°C

| Parameter                      | Symbol              | Conditions | Ratings     | Unit |
|--------------------------------|---------------------|------------|-------------|------|
| Recommended supply voltage     | V <sub>CC</sub>     |            | 9.0         | V    |
| Operating supply voltage range | V <sub>CC opg</sub> |            | 4.5 to 12.0 | V    |

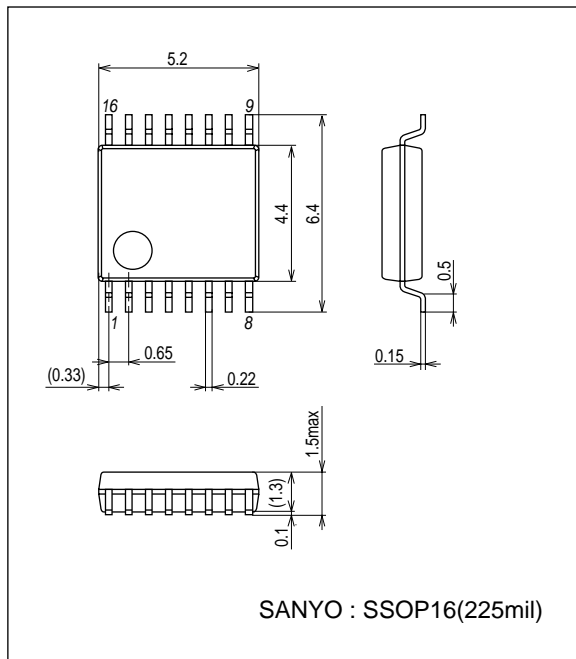
## Electrical Characteristics at Ta = 25°C, V<sub>CC</sub> = 9V, V<sub>I</sub> = 300mVrms (left and right input), f = 1kHz

| Parameter                 | Symbol               | Conditions              | Ratings |      |      | Unit |
|---------------------------|----------------------|-------------------------|---------|------|------|------|
|                           |                      |                         | min     | typ  | max  |      |
| Quiescent current         | I <sub>CC T</sub>    | No signal, surround off |         | 4    | 8    | mA   |
| Voltage gain              | V <sub>G T</sub>     | Surround off            | -2      | 0    | +2   | dB   |
|                           | V <sub>G S</sub>     | Surround on             | -2      | 0    | +2   | dB   |
| Maximum output voltage    | V <sub>O max T</sub> | THD = 3%, surround off  | 1       | 2.5  |      | Vrms |
|                           | V <sub>O max S</sub> | THD = 3%, surround on   | 1       | 2.5  |      | Vrms |
| Total harmonic distortion | THD T                | Surround off            |         | 0.01 | 0.03 | %    |
|                           | THD S                | Surround on             |         | 0.2  | 0.5  | %    |
| Crosstalk                 | CT T                 | Surround off            | 80      | 85   |      | dB   |
| Output noise voltage      | V <sub>NO T</sub>    | Surround off            |         | -100 | -90  | dBm  |
|                           | V <sub>NO S</sub>    | Surround on             |         | -90  | -80  | dBm  |
| LED current               | I <sub>LED</sub>     |                         |         | 6    | 10   | mA   |

## Package Dimensions

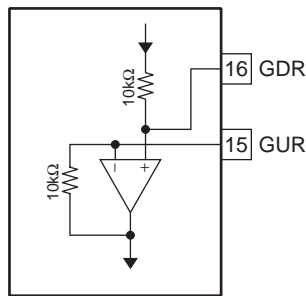
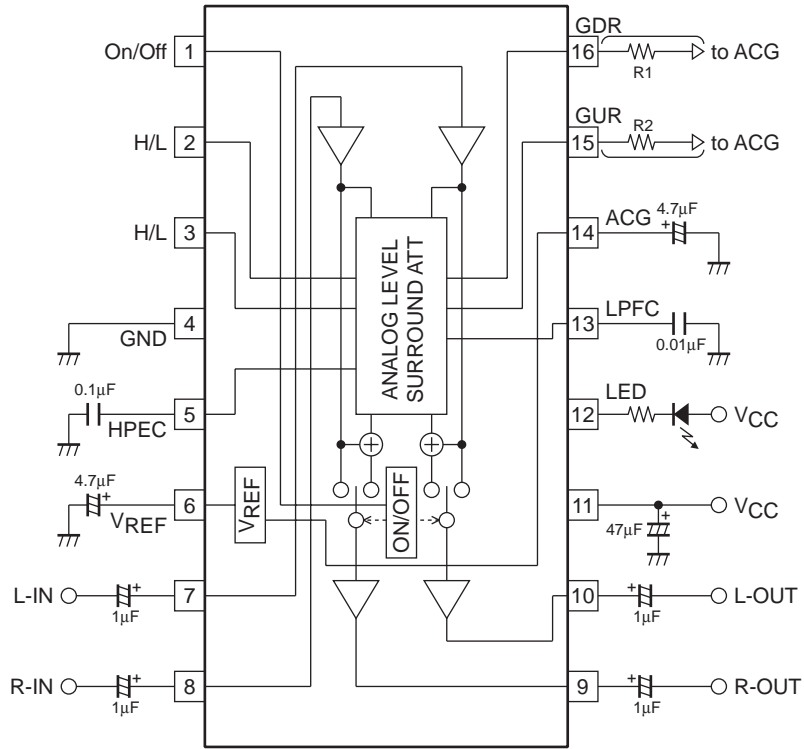
unit : mm (typ)

3178B



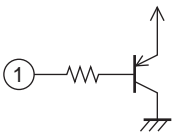
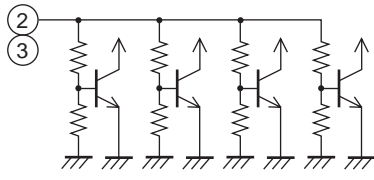
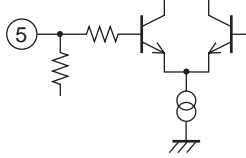
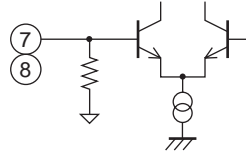
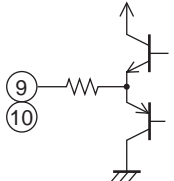
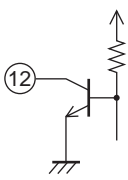
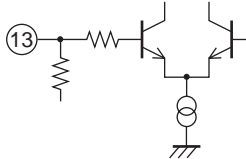
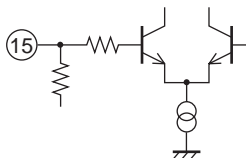
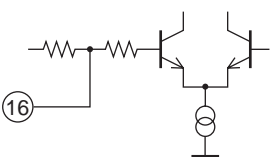
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## Block Diagram

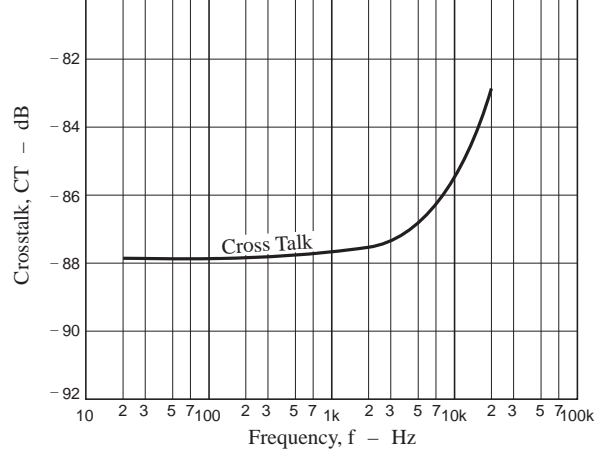
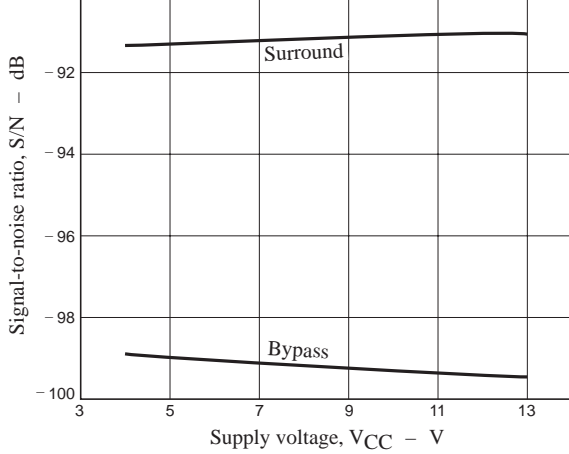
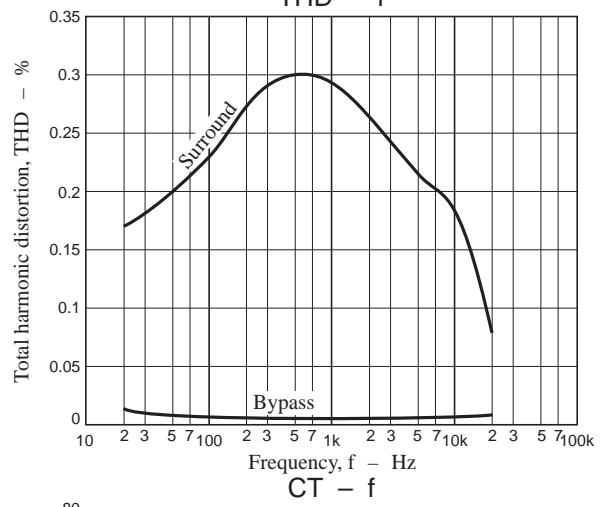
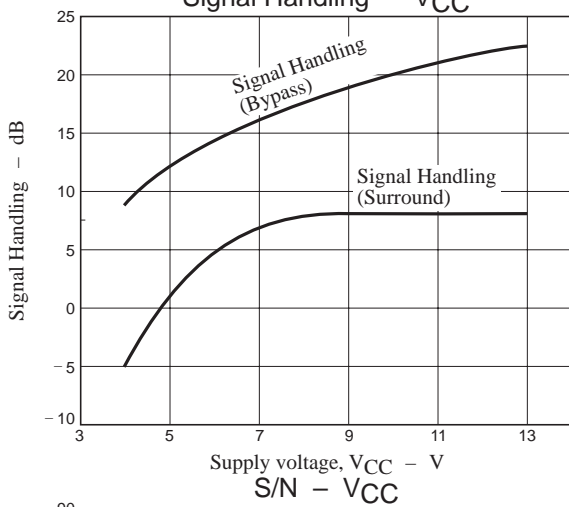
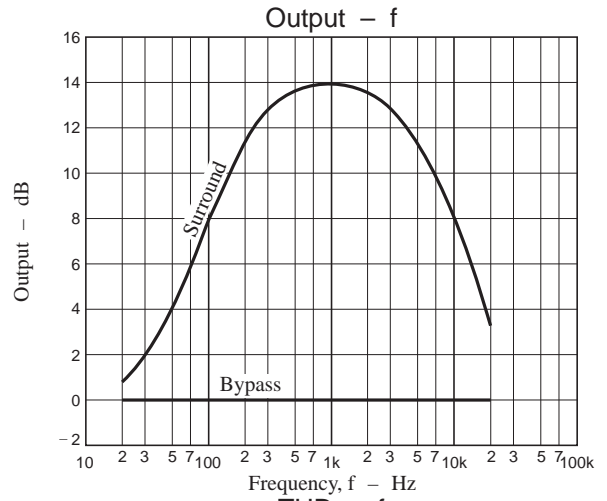
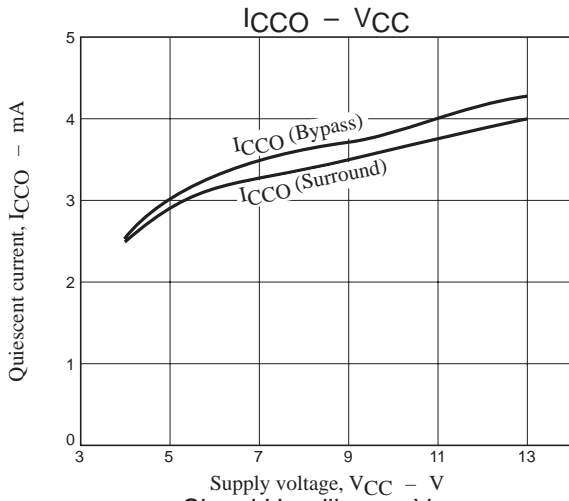


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## Pin Functions

| Pin No. | Pin name       | Pin voltage         | Pin function                          | Equivalent circuit  |
|---------|----------------|---------------------|---------------------------------------|---|
| 1       | CONT1          | 0V, 5V              | Surround on/off control               |    |
| 2<br>3  | CONT2<br>CONT3 | 0V, 5V              | Surround effect selection             |    |
| 5       | HPEC           | 1/2 V <sub>CC</sub> | High-pass filter capacitor connection |    |
| 7<br>8  | L-IN<br>R-IN   | 1/2 V <sub>CC</sub> | Input                                 |    |
| 9<br>10 | R-OUT<br>L-OUT | 1/2 V <sub>CC</sub> | Output                                |   |
| 12      | LED            | V <sub>CC</sub>     | LED connection                        |  |
| 13      | LPFC           | 1/2 V <sub>CC</sub> | Low-pass filter capacitor connection  |  |
| 15      | GUR            | 1/2 V <sub>CC</sub> | Surround effect maximum value setting |  |
| 16      | GDR            | 1/2 V <sub>CC</sub> | Surround effect maximum value setting |  |

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## Surround Effect

The maximum value of the surround effect is set with pins 15 and 16.

- The surround effect is increased by connecting an external resistor to pin 15.
- The surround effect is decreased by connecting an external resistor to pin 16.
- The device may be used with no external resistors on pins 15 and 16.

The level of the surround effect is controlled by pins 1 to 3.

| Pin 1 | Pin 2  | Pin 3 | Effect  |
|-------|--------|-------|---------|
| Low   | Low    | Low   | Maximum |
|       | High   | Low   | Midiam  |
|       | Low    | High  | Minimum |
| High  | Bypass |       |         |

Note\* : For the high level, a potential over 3V and under  $V_{CC}$  must be used.

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