



# LA2615, 2615M

## Analog Surround IC Featuring the AViSS™ 3D Surround Algorithm\*

\*: AViSS is a trademark of SANYO Electric Co., Ltd.

### Overview

The LA2615 and LA2615M are 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: 16-pin DIP (LA2615) and 16-pin MFP (LA2615M)

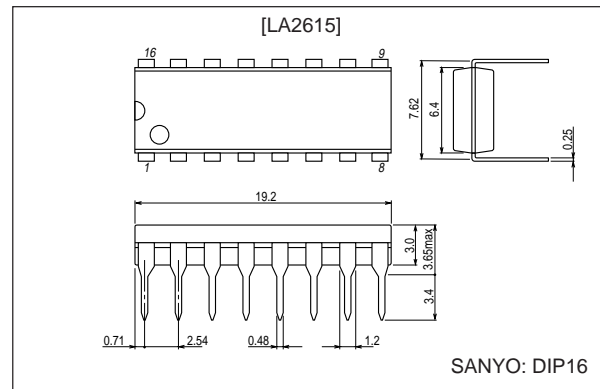
### Functions

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

### Package Dimensions

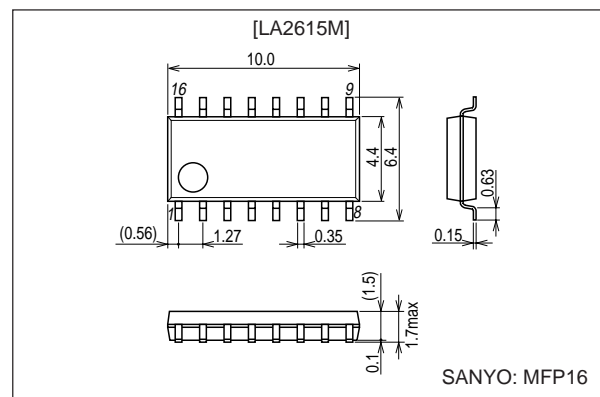
unit: mm

#### 3008B-DIP16



unit: mm

#### 3035B-MFP16



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## Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC\text{ max}}$		13	V
Allowable power dissipation	$P_d\text{ max}$		250	mW
Operating temperature	$T_{opr}$		-25 to +70	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-40 to +125	$^\circ\text{C}$

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

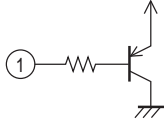
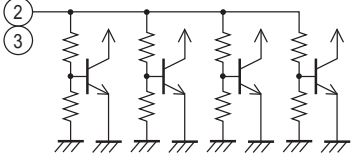
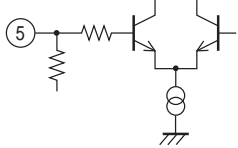
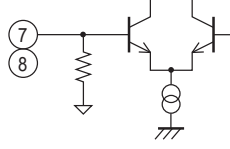
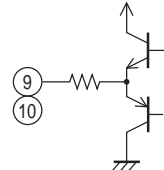
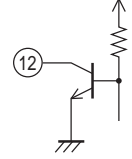
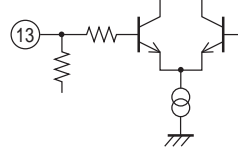
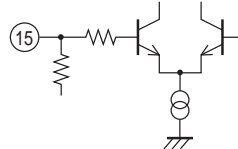
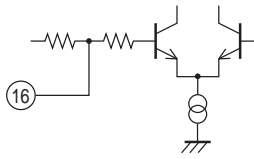
Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	$V_{CC}$		9.0	V

### Electrical Characteristics at $T_a = 25^\circ\text{C}$ , $V_{CC} = 9\text{ V}$ , $V_I = 300\text{ mV}_{rms}$ (left and right inputs), $f = 1\text{ kHz}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Quiescent current	$I_{CC\text{ T}}$	No signal, surround off		4	8	mA
Voltage gain	$V_{G\text{ T}}$	Surround off	-2	0	+2	dB
	$V_{G\text{ S}}$	Surround on	-2	0	+2	dB
Maximum output voltage	$V_{O\text{ max T}}$	THD = 3%, surround off	1	2.5		V <sub>rms</sub>
	$V_{O\text{ max S}}$	THD = 3%, surround on	1	2.5		V <sub>rms</sub>
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	$V_{NO\text{ T}}$	Surround off		-100	-90	dB
	$V_{NO\text{ S}}$	Surround off		-90	-80	dB
LED current	$I_{LED}$			6	10	mA

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Pin Functions

Pin No.	Pin	Pin voltage	Pin function	Equivalent circuit
1	CONT1	0 V, 5 V	Surround on/off control	 <p>A13471</p>
2 3	CONT2 CONT3	0 V, 5 V	Surround effect selection	 <p>A13472</p>
5	HPEC	$1/2 V_{CC}$	High-pass filter capacitor connection	 <p>A13473</p>
7 8	L-IN R-IN	$1/2 V_{CC}$	Input	 <p>A13474</p>
9 10	R-OUT L-OUT	$1/2 V_{CC}$	Output	 <p>A13475</p>
12	LED	$V_{CC}$	LED connection	 <p>A13476</p>
13	LPFC	$1/2 V_{CC}$	Low-pass filter capacitor connection	 <p>A13477</p>
15	GUR	$1/2 V_{CC}$	Surround effect maximum value setting	 <p>A13478</p>
16	GDR	$1/2 V_{CC}$	Surround effect maximum value setting	 <p>A13479</p>

### Surround Effect

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

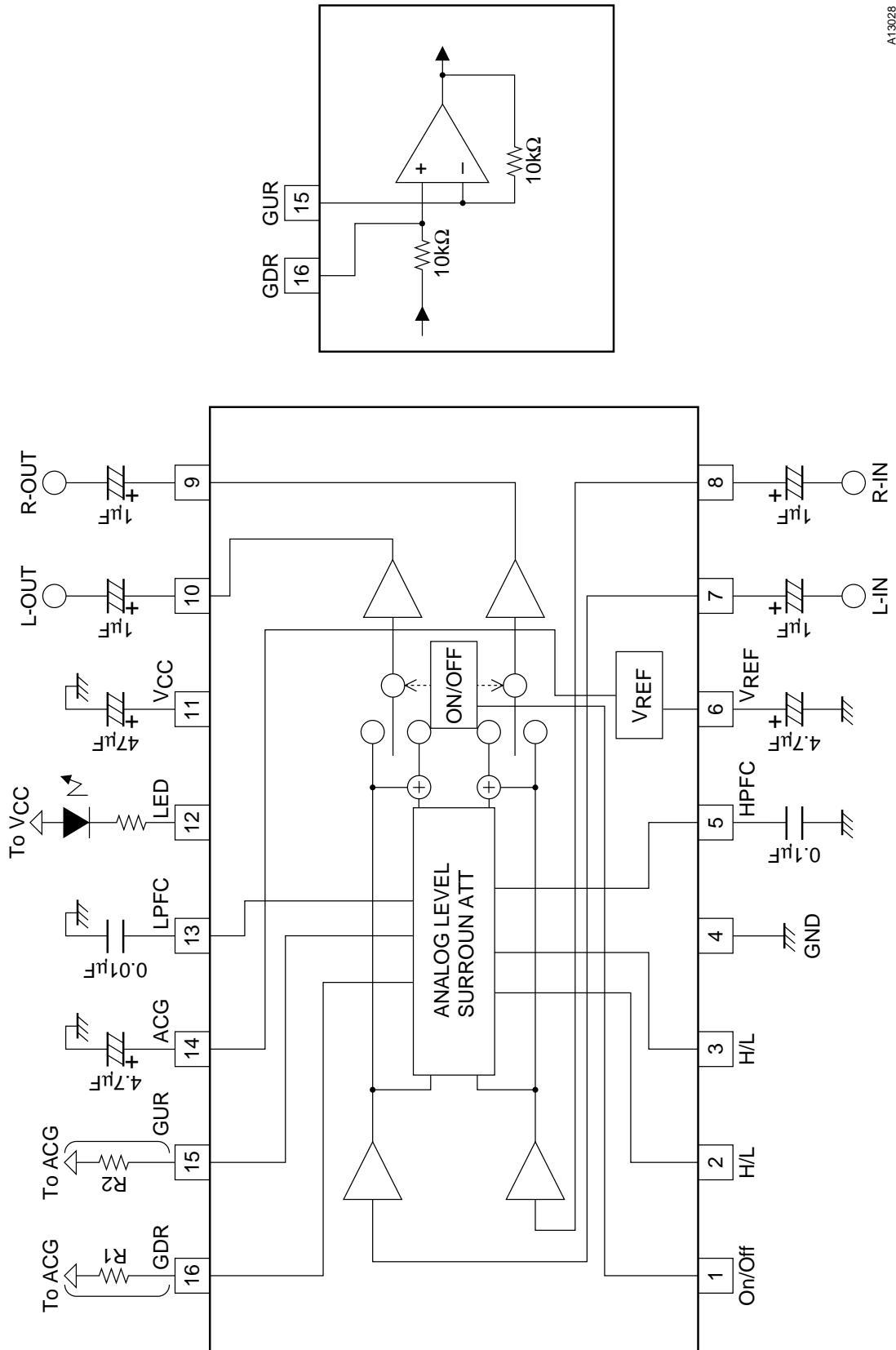
- The surround effect is increased by connecting an external resistor to pin 15.
- The surround effect is decreased by connecting an external resistor to pin 16.
- The device may be used with no external resistors on pins 15 and 16.

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

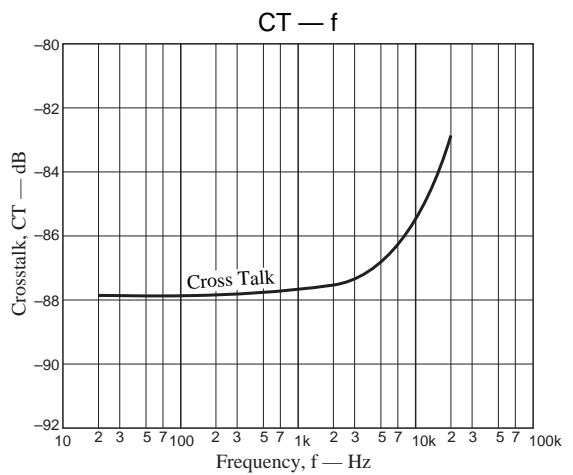
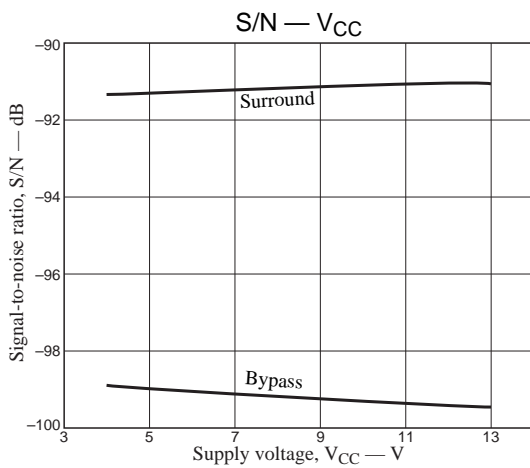
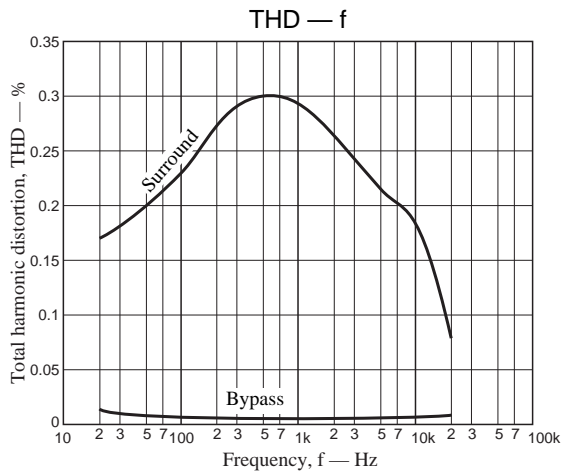
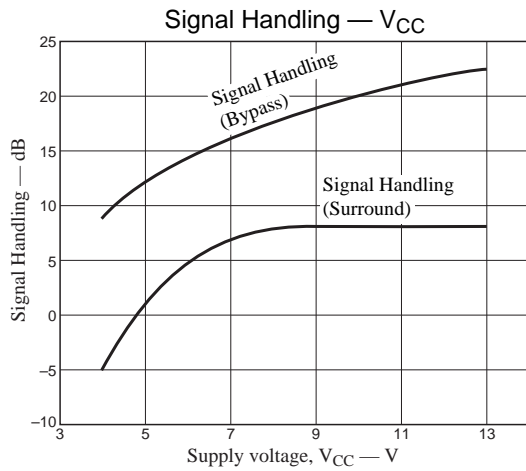
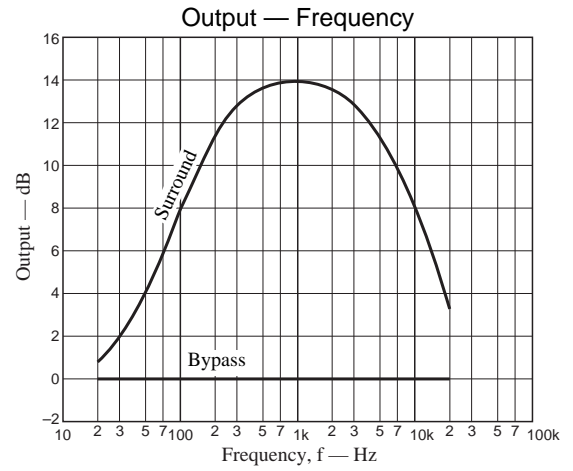
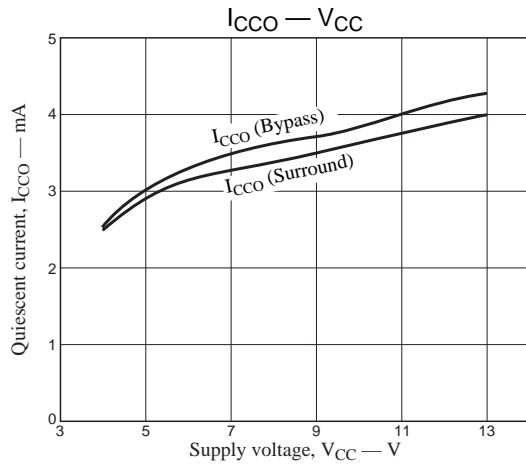
Pin 1	Pin 2	Pin 3	Effect
Low	Low	Low	Maximum
	High	Low	Midiam
	Low	High	Minimum
High	Bypass		

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

Block Diagram



A13028



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