



W6630CR Application Note

STEREO AUDIO DAC

1. GENERAL DESCRIPTION

The Winbond W6630 is a stereo audio DAC chip incorporating 8X digital interpolation filters, 64X multi-level oversampling delta-sigma modulators, analog low-pass filter and output amplifiers. The operation voltage for this chip can be from 2.7 volt to 5.25 volt. Moreover, the 16 or 18 Bit linear input data for DAC consists of two formats, normal format and I²S format. In addition, the device includes two control modes. One is hardware mode which can control mute and digital de-emphasis. The other one is software mode, where 4x9 bits internal control registers can be controlled by the serial setup port (SSP). Many functions such as 256 step attenuation, DAC mute, digital de-emphasis and format conversions can be setup through these registers.

Because the device can reach into the high performance and low-cost design, the main application for this device is used as some consumers system such as the VCD system, CD player system, and MPEG audio system.

2. FEATURES

- Power Supply from +2.7 to +5.25 Volt, typically +5 Volt, for Analog and Digital Power
- Sampling Clock Rate: 32 K, 44.1 K, and 48 KHz
- Master Clock Rate: 384 or 256 times of Sampling Clock Rate
- Stereo 16 or 18 Bits Linear PCM Data Input
- Two Types Linear PCM Data Input Format: Normal and I²S Format
- Delta-Sigma DAC built-in digital De-emphasis filter, 8X Interpolator, 64X Oversampling Multi-Bit Modulator
- Stereo DAC Output built-in Analog Low Pass Filter and Output Amplifier with 5 K Ω Load
- High Performance Audio Output: 100 dB SNR, 96 dB Dynamic Range and -90 dB THD+N
- Two Control Function Modes: Hardware Mode and Software Mode Selected by Mode Pin
- Software Mode Controlled by 4 x 9 bits Registers via Serial Setup Port (SSP)
- Main Control Functions: De-emphasis, Mute, 256 Step Attenuation, Channel Output Combination, Input Format Select such 16 or 18 Bit, I²S or Normal
- Packaged in 20 pin SSOP

3. APPLICATION NOTES

This device has two power supply. One is the digital power (DVDD); the other is the analog power (AVDD). The positive value is supplied from 2.7 to 5.25 volt.

The application circuit for VCD (Video-CD) is referred to Figure 5-1 as follows. It uses the oscillator as the master clock input. Therefore, the XTALO pin is opened. The audio data input source can be either from MPEG audio decoder or Sound processor. The chip can be selected either hardware mode or software mode by MODE pin. If user selects the software mode, the configuration value may be from the micro-processor via the serial setup port (SSP). In addition, the stereo channel outputs

optionally select an external low-pass filter and power amplifier to achieve the self-design requirement.

Because the reset pin has pull-up resistor internally and the value is about 100 K Ω , user only add a capacitor to generate external reset pulse. The value for this capacitor is about 33 μ F depended on VCD power system, shown in Figure 5-1. In addition, user also can generate a software reset pulse from micro-processor, shown in Figure 5-2. The reset signal is from some I/O port of micro-processor.

The most of I/O pins for this chip are TTL compatible except for SSP_EN, SSPCLK, RESET, MODE pins. These values are described in DC spec of data sheet.

In addition, the device is built-in power on reset circuit internally. If the RESET pin is tied logic-one directly and in order to ensure the power-on circuit work well, user had better add two different capacitor value at AVDD and DVDD pin in parallel. The capacitor value of AVDD is bigger than the one of DVDD because the power-on reset circuit is supplied from AVDD pin. For example, the value of DVDD is 0.1 μ F and the one of AVDD is 10 μ F depended on the power system from VCD player, shown in Figure 5-3.

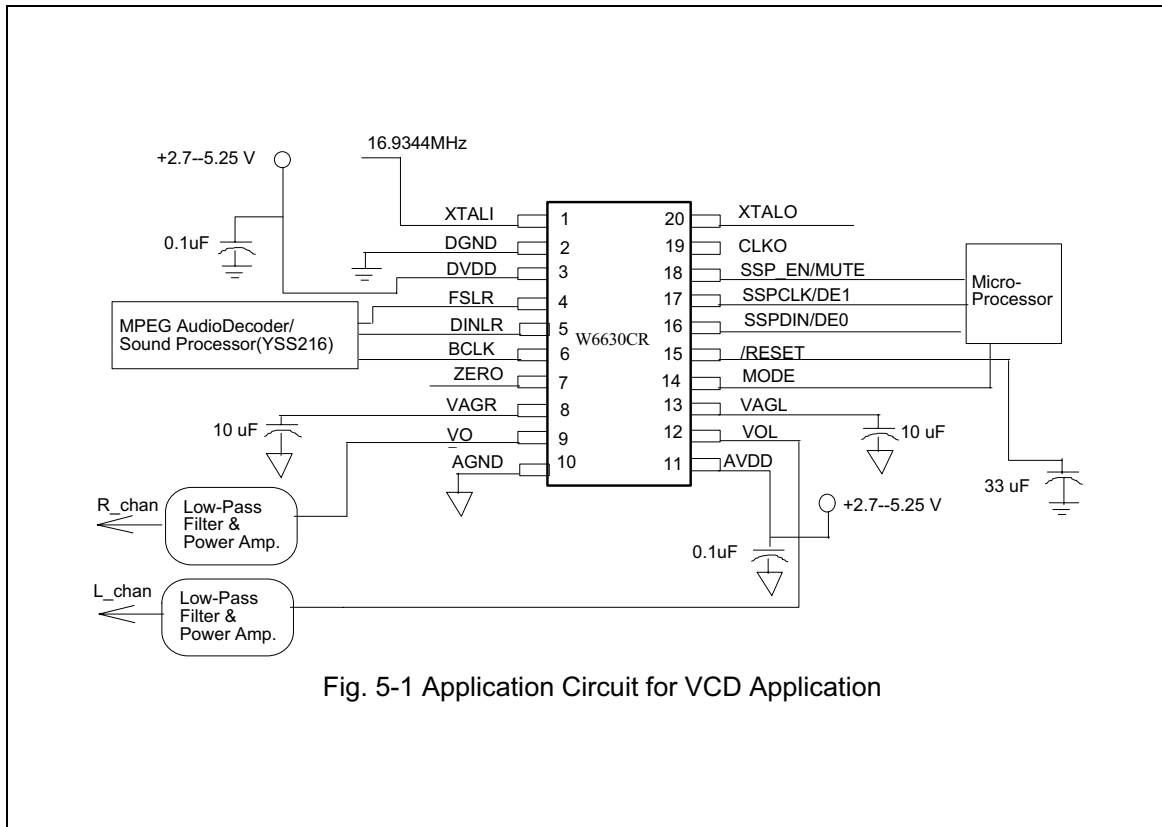


Fig. 5-1 Application Circuit for VCD Application

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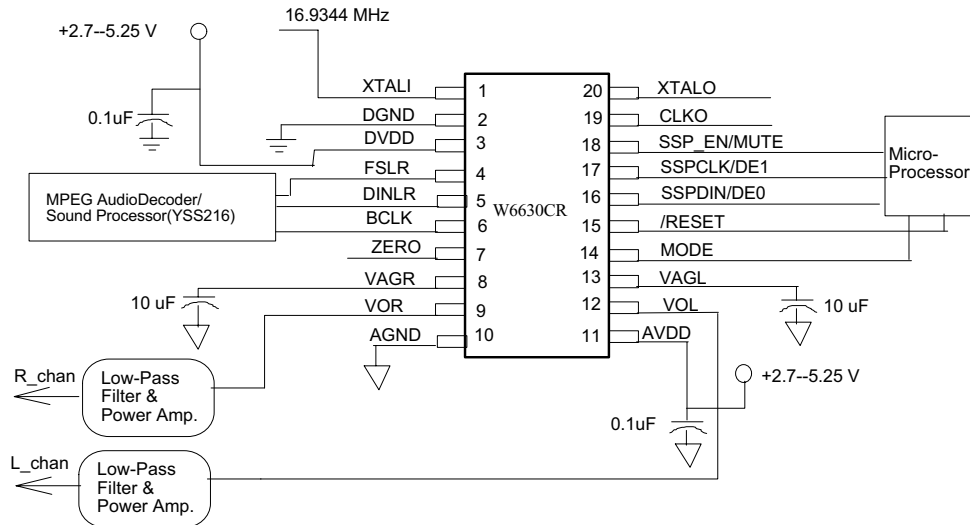


Fig. 5-2 Application Circuit for Software Reset from micro-processor

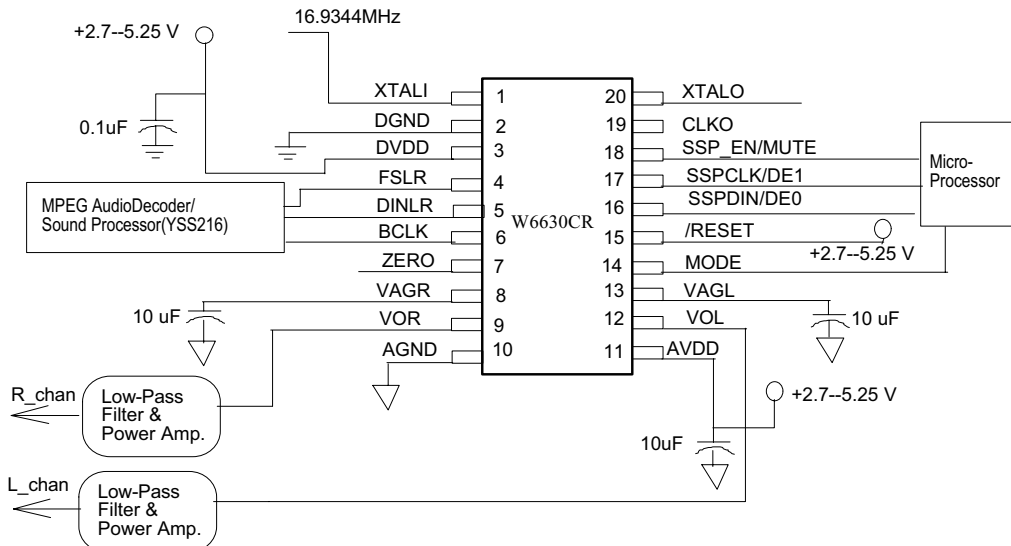


Fig. 5-3 Application Circuit for Power-ON Reset

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Note: All data and specifications are subject to change without notice.