AK4377

High Sound Quality Advanced DAC with HP

1. General Description

The AK4377 is stereo advanced 32-bit high sound quality audio DAC with a built-in ground-referenced headphone amplifier that adopted VELVET SOUND™ technology. The AK4377 has four types of 32-bit digital filters for better sound quality, achieving low distortion characteristics and wide dynamic range. AK4377 accepts up to 768 kHz PCM data and DSD256 input. The AK4377 is available in a 36-pin CSP package, utilizing less board space than competitive offerings.

2. Features

1. **Stereo High Sound Quality Advanced 32-bit DAC**
   - **4-types of Digital Filter for Sound Color Selection**
   - **2-types of Operation Mode (High Performance Mode / Low Power Mode)**
2. **Ground-referenced Class-G Stereo Headphone Amplifier**
   - **Output Power: 60 mW @ 16Ω**
   - **THD+N: –109 dB @ Po = 10 mW, R_L = 32Ω**
     –106 dB @ Po = 25 mW, R_L = 32Ω
   - **S/N: 128 dB**
   - **Output Noise Level: –129 dBV**
   - **Analog Volume: +4 to –20 dB & Mute**
   - **Ground Loop Noise Cancellation**
3. **Headphone Amplifier Output Pins Comply with IEC61000-4-2 Level4 ESD Protection**
4. **Digital Audio Interface**
   - **Master/Slave Mode**
   - **Sampling Frequency:**
     Slave Mode: 8 k, 11.025 k, 12 k, 16 k, 22.05 k, 24 k, 32 k, 44.1 k, 48 k, 64 k, 88.2 k, 96 k, 128 k, 176.4 k, 192 k, 256 k, 352.8 k, 384 k, 512 k, 705.6 k, 768 kHz
     Master Mode: 8 k, 11.025 k, 12 k, 16 k, 22.05 k, 24 k, 32 k, 44.1 k, 48 k, 64 k, 88.2 k, 96 k, 128 k, 176.4 k, 192 k, 256 k, 352.8 k, 384 kHz
   - **Interface Format: 32/24/16-bit I^2S/MSB justified**
   - **DSD Support by DoP: DSD64, DSD128, DSD256**
5. **Power Management**
6. **PLL**
7. **X'tal Oscillator**
8. **µP Interface: I^2C-bus (400 kHz)**
9. **Operation Temperature Range: Ta = –40 to 85°C**
10. **Power Supply:**
    - **AVDD (DAC, PLL): 1.7 to 1.9 V**
    - **CVDD (Headphone Amplifiers, Charge Pump): 1.7 to 1.9 V**
    - **LVDD (LDO2 for Digital Core): 1.7 to 1.9 V (built-in LDO)**
    - **TVDD (Digital Interface): 1.65 to 3.6 V**
11. **Package: 36-pin CSP (2.893 x 3.082 mm, 0.4 mm pitch)**

3. Block Diagram and Functions

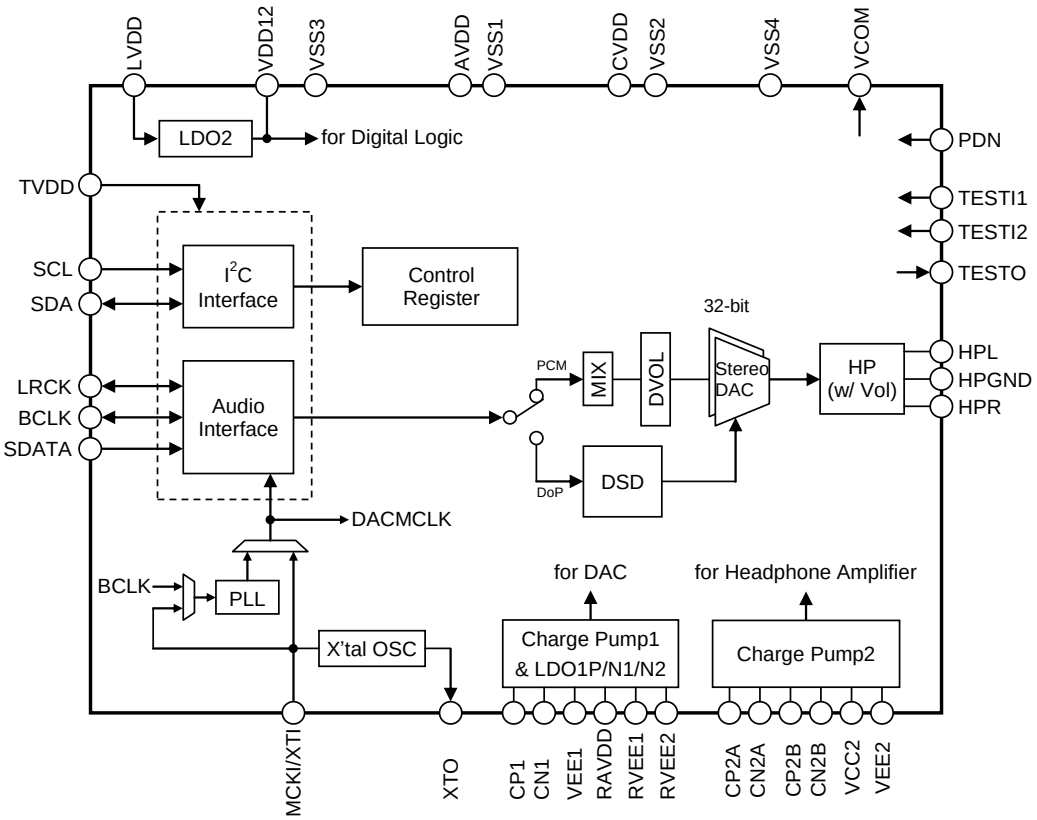
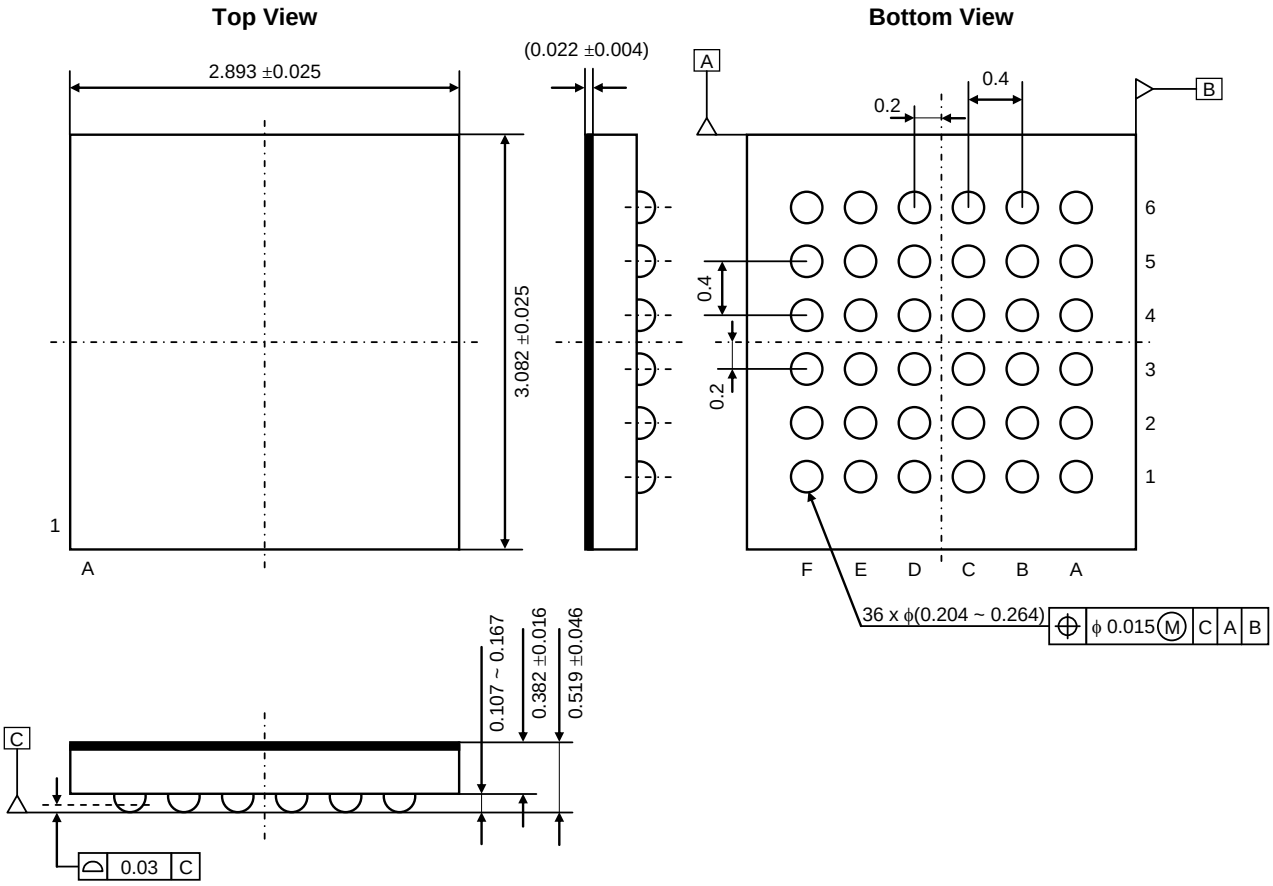


Figure 1. AK4377 Block Diagram

4. Package

■ Outline Dimensions

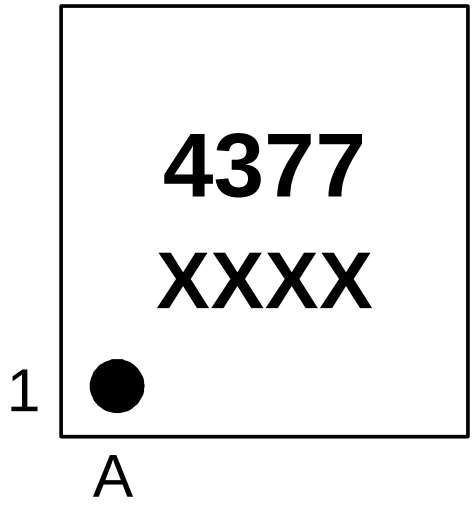
36-pin CSP (Unit: mm)



■ Material and Lead Finish

Package molding compound: Epoxy Resign, Halogen free
Solder ball material: SnAgCu

■ **Marking**



XXXX: Date code (4 digits)
Pin #A1 indication

5. Ordering Guide

AK4377ECB	−40 to 85 °C	36-pin CSP (0.4 mm pitch)
AKD4377	Evaluation board for AK4377	

6. Revision History

Date (Y/M/D)	Revision	Reason	Page	Contents
18/02/27	00	First Edition		

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