


General Purpose Audio Codec 2ADC / 2DAC Ch 28-Pin VQFN EP T/R

Manufacturer:	<u>Texas Instruments, Inc</u>
Package/Case:	QFN
Product Type:	Communication & Networking ICs
RoHS:	RoHS Compliant/Lead free 
Lifecycle:	LTB



Images are for reference only

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General Description

The TLV320AIC23B is a high-performance stereo audio codec with highly integrated analog functionality. The analog-to-digital converters (ADCs) and digital-to-analog converters (DACs) within the TLV320AIC23B use multibit sigma-delta technology with integrated oversampling digital interpolation filters. Data-transfer word lengths of 16, 20, 24, and 32 bits, with sample rates from 8 kHz to 96 kHz, are supported. The ADC sigma-delta modulator features third-order multibit architecture with up to 90-dBA signal-to-noise ratio (SNR) at audio sampling rates up to 96 kHz, enabling high-fidelity audio recording in a compact, power-saving design. The DAC sigma-delta modulator features a second-order multibit architecture with up to 100-dBA SNR at audio sampling rates up to 96 kHz, enabling high-quality digital audio-playback capability, while consuming less than 23 mW during playback only. The TLV320AIC23B is the ideal analog input/output (I/O) choice for portable digital audio-player and recorder applications, such as MP3 digital audio players.

Integrated analog features consist of stereo-line inputs with an analog bypass path, a stereo headphone amplifier, with analog volume control and mute, and a complete electret-microphone-capsule biasing and buffering solution. The headphone amplifier is capable of delivering 30 mW per channel into 32 . The analog bypass path allows use of the stereo-line inputs and the headphone amplifier with analog volume control, while completely bypassing the codec, thus enabling further design flexibility, such as integrated FM tuners. A microphone bias-voltage output provides a low-noise current source for electret-capsule biasing. The AIC23B has an integrated adjustable microphone amplifier (gain adjustable from 1 to 5) and a programmable gain microphone amplifier (0 dB or 20 dB). The microphone signal can be mixed with the output signals if a sidetone is required.

While the TLV320AIC23B supports the industry-standard oversampling rates of 256 fs and 384 fs, unique oversampling rates of 250 fs and 272 fs are provided, which optimize interface considerations in designs using TI C54x digital signal processors (DSPs) and universal serial bus (USB) data interfaces. A single 12-MHz crystal can supply clocking to the DSP, USB, and codec. The TLV320AIC23B features an internal oscillator that, when connected to a 12-MHz external crystal, provides a system clock to the DSP and other peripherals at either 12 MHz or 6 MHz, using an internal clock buffer and selectable divider. Audio sample rates of 48 kHz and compact-disc (CD) standard 44.1 kHz are supported directly from a 12-MHz master clock with 250 fs and 272 fs oversampling rates.

Low power consumption and flexible power management allow selective shutdown of codec functions, thus extending battery life in portable applications. This design solution, coupled with the industry's smallest package, the TI proprietary MicroStar Junior using only 25 mm² of board area, makes powerful portable stereo audio designs easily realizable in a cost-effective, space-saving total analog I/O solution: the TLV320AIC23B.

Key Features

High-Performance Stereo Codec

90-dB SNR Multibit Sigma-Delta ADC (A-weighted at 48 kHz)

100-dB SNR Multibit Sigma-Delta DAC (A-weighted at 48 kHz)

1.42 V – 3.6 V Core Digital Supply: Compatible With TI C54x DSP Core Voltages

2.7 V – 3.6 V Buffer and Analog Supply: Compatible Both TI C54x DSP Buffer Voltages

8-kHz – 96-kHz Sampling-Frequency Support

Software Control Via TI McBSP-Compatible Multiprotocol Serial Port

2-wire-Compatible and SPI-Compatible Serial-Port Protocols

Glueless Interface to TI McBSPs

Audio-Data Input/Output Via TI McBSP-Compatible Programmable Audio Interface

I2S-Compatible Interface Requiring Only One McBSP for both ADC and DAC

Standard I2S, MSB, or LSB Justified-Data Transfers

16/20/24/32-Bit Word Lengths

Audio Master/Slave Timing Capability Optimized for TI DSPs (250/272 fs), USB mode

Industry-Standard Master/Slave Support Provided Also (256/384 fs), Normal mode

Glueless Interface to TI McBSPs

Integrated Total Electret-Microphone Biasing and Buffering Solution

Low-Noise MICBIAS pin at 3/4 AVDD for Biasing of Electret Capsules

Integrated Buffer Amplifier With Tunable Fixed Gain of 1 to 5

Additional Control-Register Selectable Buffer Gain of 0 dB or 20 dB

Stereo-Line Inputs

Integrated Programmable Gain Amplifier

Analog Bypass Path of Codec

ADC Multiplexed Input for Stereo-Line Inputs and Microphone

Stereo-Line Outputs

Analog Stereo Mixer for DAC and Analog Bypass Path

Volume Control With Mute on Input and Output

Highly Efficient Linear Headphone Amplifier

30 mW into 32 Ω From a 3.3-V Analog Supply Voltage

Flexible Power Management Under Total Software Control

23-mW Power Consumption During Playback Mode

Standby Power Consumption <150 μ W

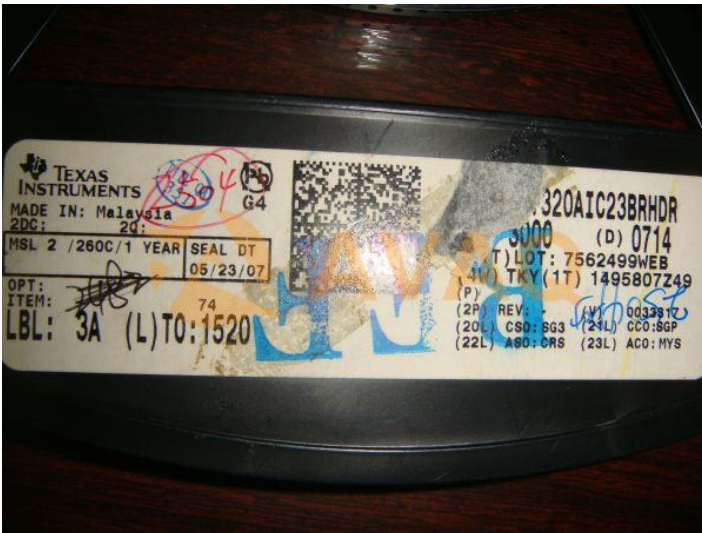
Power-Down Power Consumption <15 μ W

Industry's Smallest Package: 32-Pin TI Proprietary MicroStar Junior?

25 mm² Total Board Area

28-Pin TSSOP Also Is Available (62 mm² Total Board Area)

Ideally Suitable for Portable Solid-State Audio Players and Recorders



Recommended For You

TLV320AIC23BIPWR

Texas Instruments, Inc
TSSOP28

TLV320AIC3104IRHBR

Texas Instruments, Inc
QFN32

TL16C554AIPN

Texas Instruments, Inc
LQFP80

TLV320AIC3101IRHBR

Texas Instruments, Inc
QFN32

TL16C554APN

Texas Instruments, Inc
LQFP80

TLV320AIC24KIPFBR

Texas Instruments, Inc
TQFP-48

TL16C554PN

Texas Instruments, Inc
QFP

TLV320AIC24KIPFB

Texas Instruments, Inc
TQFP-48

TL16C752BLPTREP

Texas Instruments, Inc
LQFP-48

TL16C550DIPFBR

Texas Instruments, Inc
48-TQFP

TLC320AC01CFN

Texas Instruments, Inc
PLCC28

TL16C552AFN

Texas Instruments, Inc
PLCC

TL16C450FN

Texas Instruments, Inc
PLCC44

TL16C554FN

Texas Instruments, Inc
PLCC

TLV320AIC311RHBR

Texas Instruments, Inc
VQFN32