# 6PAIC3104IRHBRQ1

**PCM Audio Codec 2ADC / 2DAC Ch Automotive 32-Pin VQFN EP T/R**

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| **Manufacturer:** | Texas Instruments, Inc |
| **Package/Case:** | VQFN32 |
| **Product Type:** | Communication & Networking ICs |
| **RoHS:** | RoHS Compliant/Lead free |
| **Lifecycle:** | Active |

6PAIC3104IRHBRQ1 Image

Images are for reference only

Inquiry

## General Description

The TLV320AIC3104-Q1 is a low-power stereo audio codec with stereo headphone amplifiers, as well as multiple inputs and outputs that are programmable in single-ended or fully differential configurations. Extensive register-based power control is included, enabling stereo 48-kHz DAC playback as low as 14 mW from a 3.3-V analog supply, making it ideal for car audio applications in cluster and head unit systems.

The record path of the TLV320AIC3104-Q1 contains integrated microphone bias, digitally controlled stereo microphone preamplifier, and automatic gain control (AGC), with mix/mux capability among the multiple analog inputs. Programmable filters are available during record which can remove audible noise that can occur during noisy and unpredictable environments, such as when an e-call system is activated. The playback path includes mix/mux capability from the stereo DAC and selected inputs, through programmable volume controls, to the various outputs.

The TLV320AIC3104-Q1 contains four high-power output drivers as well as two fully differential output drivers. The high-power output drivers are capable of driving a variety of load configurations, including up to four channels of single-ended 16- headphones using AC-coupling capacitors, or stereo 16- headphones in a capless output configuration. These parameters enable the TLV320AIC3104-Q1 to act as an interface between the MCU and speaker amplifiers, such as the TPA3111D1-Q1, in various audio applications in the infotainment and cluster fields.

The stereo audio DAC supports sampling rates from 8 kHz to 96 kHz and includes programmable digital filtering in the DAC path for 3D, bass, treble, midrange effects, speaker equalization, and de-emphasis for 32-kHz, 44.1-kHz, and 48-kHz sample rates. The stereo audio ADC supports sampling rates from 8 kHz to 96 kHz and is preceded by programmable gain amplifiers (PGA) or an automatic gain control (AGC) circuit that can provide up to 59.5-dB analog gain for low-level microphone inputs. The TLV320AIC3104-Q1 provides an extremely high range of programmability for both attack (8 ms to 1,408 ms) and for decay (0.05 s to 22.4 s). This extended AGC range allows the AGC to be tuned for many types of applications.

Where neither analog nor digital signal processing are required, the device can be put in a special analog signal passthrough mode. This mode significantly reduces power consumption, as most of the device is powered down during this passthrough operation.

The serial control bus supports the $I^2C$ protocol, whereas the serial audio data bus is programmable for $I^2S$, left/right-justified, DSP, or TDM modes. A highly programmable PLL is included for flexible clock generation and support for all standard audio rates from a wide range of available MCLKs, varying from 512 kHz to 50 MHz, with special attention paid to the most-popular cases of 12-MHz, 13-MHz, 16-MHz, 19.2-MHz, and 19.68-MHz system clocks.

The TLV320AIC3104-Q1 operates from an analog supply of 2.7 V to 3.6 V, a digital core supply of 1.525 V to 1.95 V, and a digital I/O supply of 1.1 V to 3.6 V.

## Key Features

Qualified for Automotive Applications

AEC-Q100 Qualified With the Following Results:
Device Temperature Grade 3: –40°C to 105°C Ambient Operating Temperature Range

Device HBM ESD Classification Level 2

Device CDM ESD Classification Level C6

Stereo Audio DAC:
102-dBA Signal-to-Noise Ratio

16-, 20-, 24-, or 32-Bit Data

Supports Sample Rates From 8 kHz to 96 kHz

3D, Bass, Treble, EQ, De-Emphasis Effects

Flexible Power Saving Modes and Performance are Available

Stereo Audio ADC:
92-dBA Signal-to-Noise Ratio

Supports Sample Rates From 8 kHz to 96 kHz

Digital Signal Processing and Noise Filtering available during record

Six Audio Input Pins:
One Stereo Pair of Single-Ended Inputs

One Stereo Pair of Fully Differential Inputs

Six Audio Output Drivers:
Fully Differential or Single-Ended Stereo Headphone Drivers

Fully Differential Stereo Line Outputs

Low Power: 14-mW Stereo, 48-kHz Playback With 3.3-V Analog Supply

Ultralow-Power Mode With Passive Analog Bypass

Programmable Input/Output Analog Gains

Automatic Gain Control (AGC) for Record

Programmable Microphone Bias Level

Programmable PLL for Flexible Clock Generation

$I^2C$ Control Bus

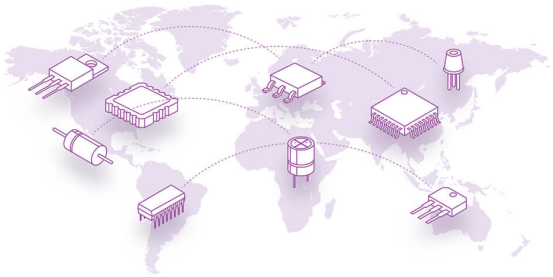
Audio Serial Data Bus Supports $I^2S$, Left/RightJustified, DSP, and TDM Modes

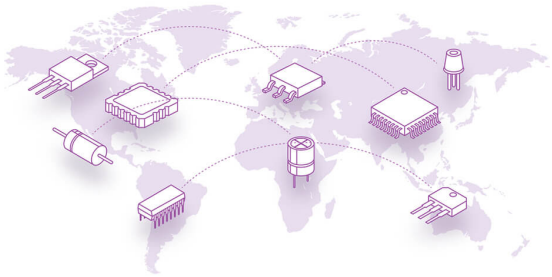
Extensive Modular Power Control

Power Supplies:
Analog: 2.7 V to 3.6 V

Digital Core: 1.525 V to 1.95 V

Digital I/O: 1.1 V to 3.6 V





## Recommended For You

**TLV320AIC1106PW**

Texas Instruments, Inc

TSSOP20

**XTR106P**

Texas Instruments, Inc

DIP14

**SN65LBC176P**

Texas Instruments, Inc

DIP

**XTR106PA**

Texas Instruments, Inc

DIP-14

**TSB12LV26PZT**

Texas Instruments, Inc

QFP100

**TCA6416PW**

Texas Instruments, Inc

TSSOP

**TPD12S016PWR**

Texas Instruments, Inc

TSSOP24

**TUSB1106PWR**

Texas Instruments, Inc

TSSOP16

**6PAIC3109TRHBRQ1**

Texas Instruments, Inc

QFN32

**SN75LBC176P**

Texas Instruments, Inc

DIP

**UCC5686PMG4**

Texas Instruments, Inc

BGA

**6PAIC3254IRHBRQ1**

Texas Instruments, Inc

QFN32

**TSB41LV06PZP**

Texas Instruments, Inc

TQFP100

**TL16PC564APZ**

Texas Instruments, Inc

TQFP

**UCC5686PM**

Texas Instruments, Inc

QFP