ROHM Musical Device
MUS-IC

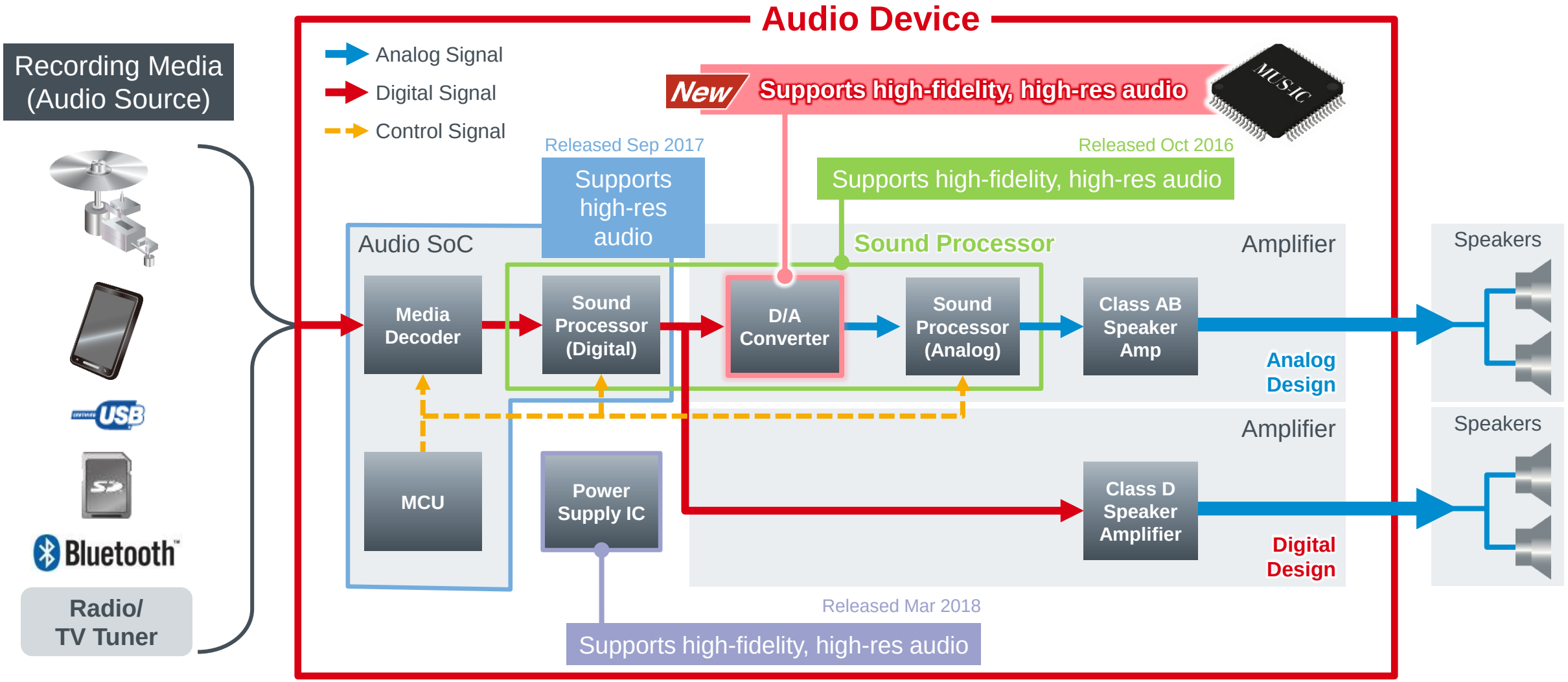
32bit D/A Converter IC ‘BD34301EKV’ for Hi-Fi Audio Equipment

ROHM's first, most advanced MUS-IC™ series DAC chip enables expressive playback of classical music

April 1, 2021
ROHM Co., Ltd.
Marketing Communications Dept.

*MUS-IC™ is a trademark or registered trademark of ROHM Co., Ltd.
*Please note that this document is current as of the date of publication

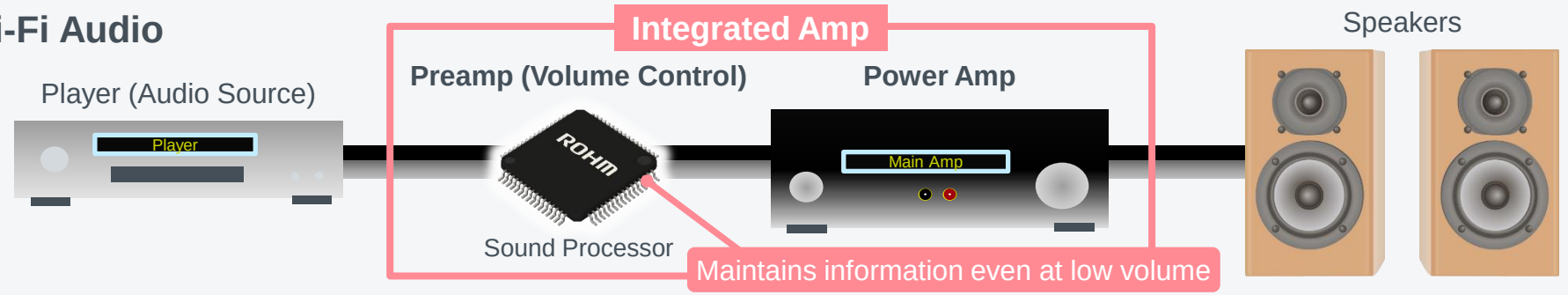
High Fidelity Audio Equipment and ROHM's Approach



We are developing a variety of products for high-fidelity audio equipment that supports high-resolution audio playback

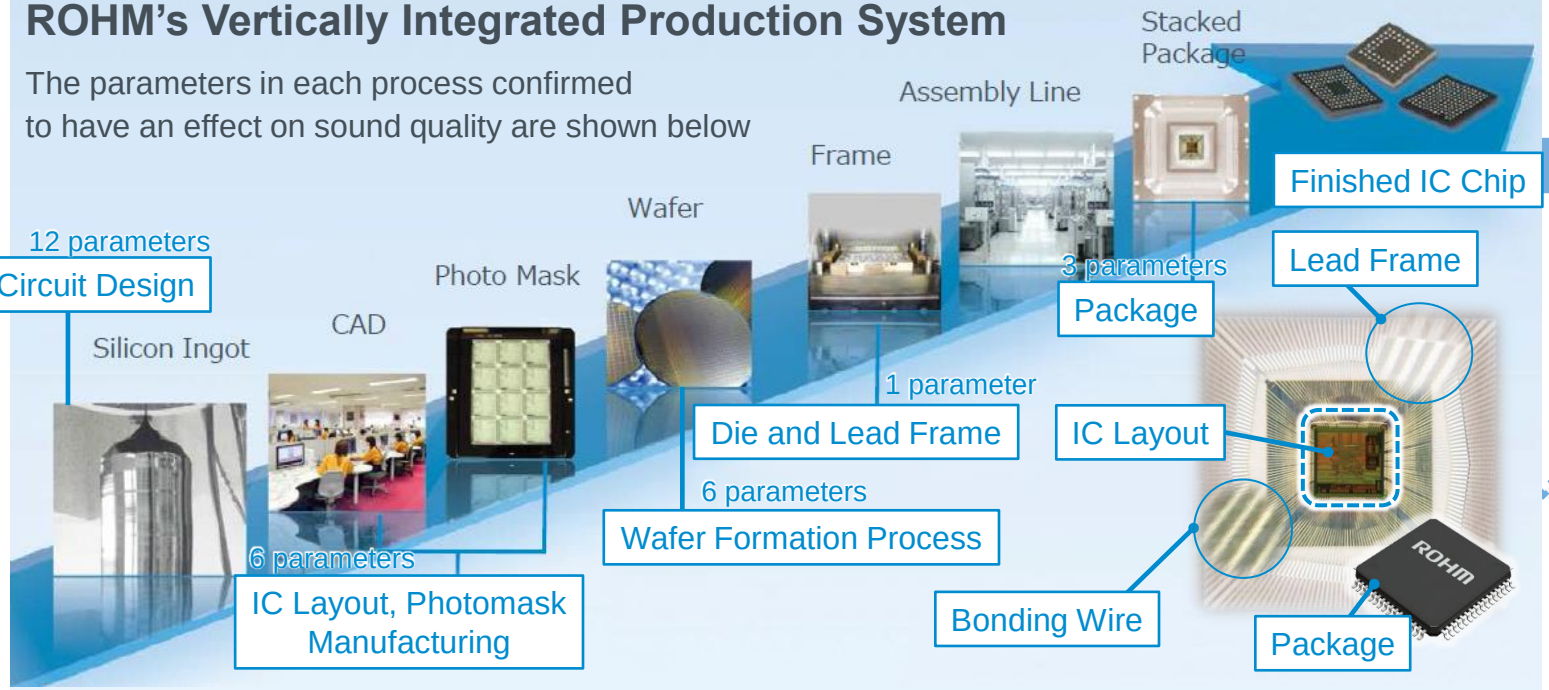
Achieving Optimum Sound Quality Using ROHM's Vertically Integrated Production System and Sound Quality Design Technology

Ex) Sound Processors for Hi-Fi Audio



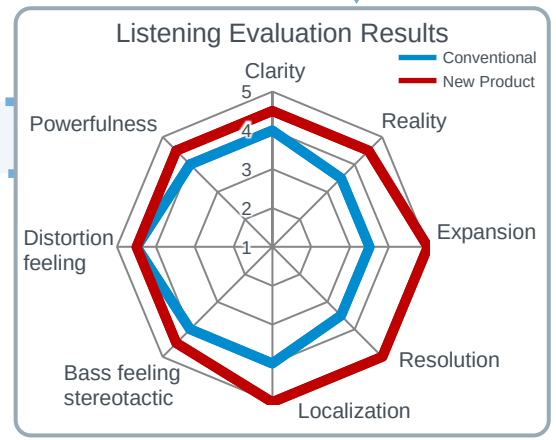
ROHM's Vertically Integrated Production System

The parameters in each process confirmed to have an effect on sound quality are shown below



Verify the sound quality in a dedicated listening room
(At the Yokohama Technology Center)

Check sound quality through actual listening evaluation based on a set of indicators



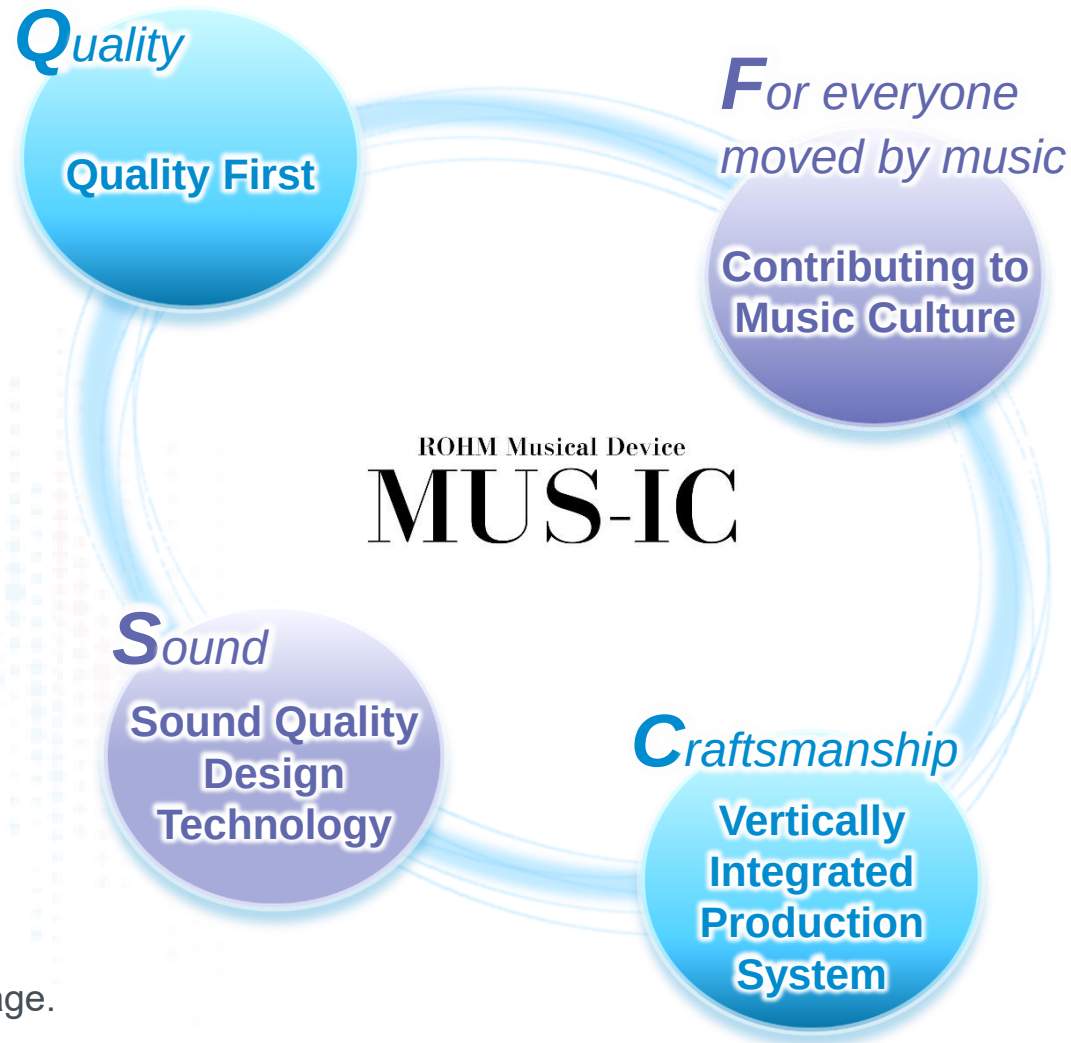
At various steps in our vertically integrated production process, we have identified 28 parameters that affect sound quality and adjusted them one by one to create the desired sound

ROHM's High-End Audio Device Brand: ROHM Musical Device [MUS-IC]

ROHM Musical Device
MUS-IC

MUS-IC™

Created by combining the '**Sound Quality Design Technology**' with ROHM's corporate mission of '**Quality First**', '**Vertically Integrated Production System**', and '**Contribution to the Musical Culture**', MUS-IC™ (official name: ROHM Musical Device 'MUS-IC™') is an audio device brand that represents the ultimate IC solutions developed by ROHM's team of experienced and dedicated engineers.



For more information, please visit ROHM's Musical Device 'MUS-IC™' web page.
https://www.rohm.com/mus-ic/

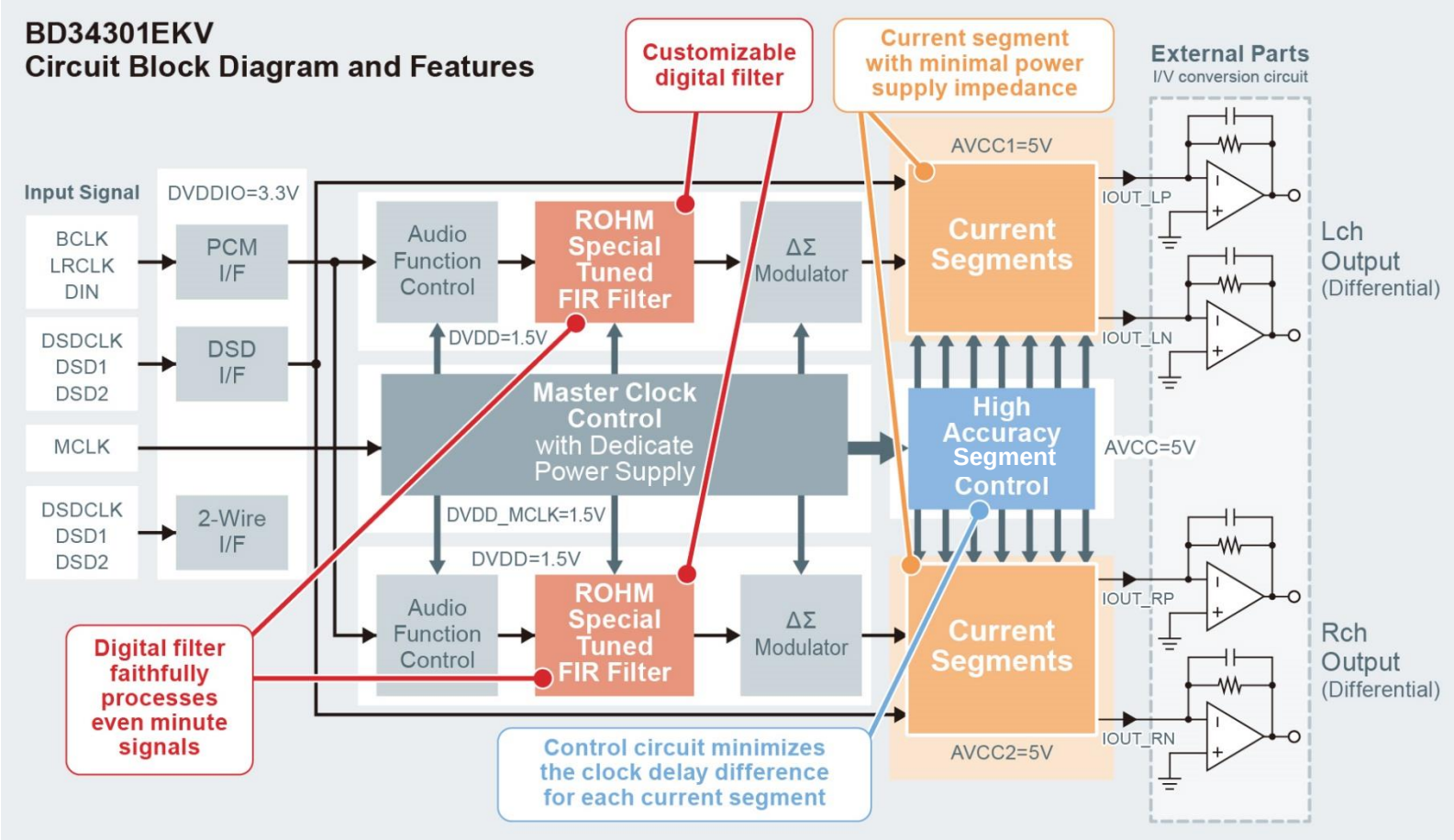
Development Concept

BD34301EKV MUS-IC™ 32bit D/A Converter IC
Product Overview

ROHM's first top-shelf MUS-IC™ series of DAC chips enables expressive playback of classical music

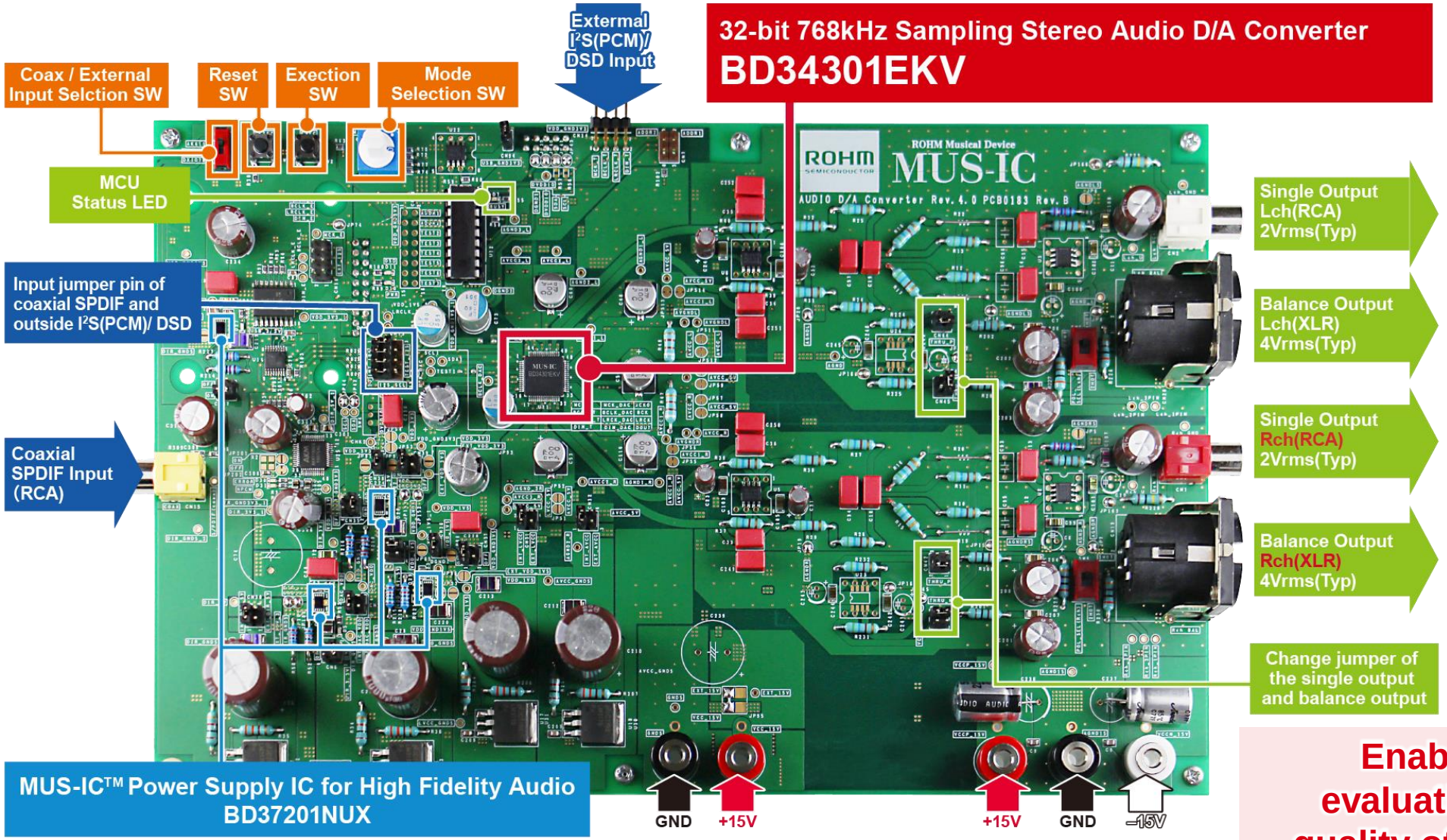
Key Characteristics

No. of Outputs: 2ch (stereo)
Resolution: 32bit
Sampling Frequency: 32kHz to 768kHz
S/N Ratio: 130dB (typ.)
THD+N: -115dB (typ.)
DSD Clock: 2.8MHz, 5.6MHz, 11.2MHz, 22.4 MHz
FIR Filter: Preset, Custom, External



We will begin selling the BD34301EKV DAC chip along with an evaluation board that allows users to immediately verify sound quality

BD34301EKV-EVK-001 Evaluation Board

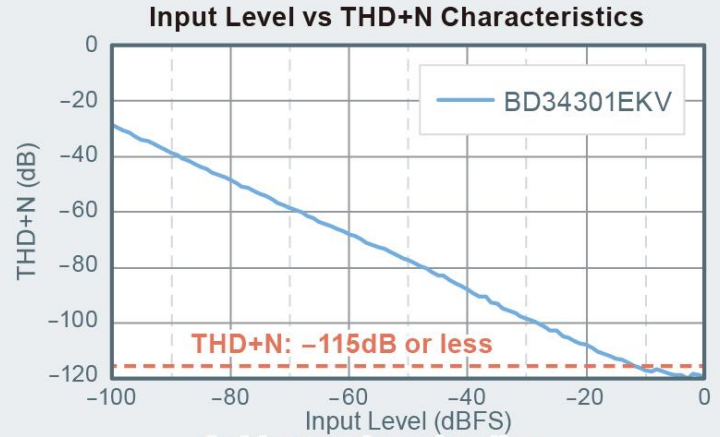


Enables immediate evaluation of the sound quality of the BD34301EKV

Please refer to the evaluation board user's guide for details.
https://fscdn.rohm.com/en/products/databook/applinote/ic/audio_video/bd34301ekv_evk_001_ug-e.pdf

Feature 1: Achieves best-in-class sound quality characteristics ideal for classical music

The BD34301EKV delivers superior performance in audio equipment by improving sound quality in ways that cannot be defined by numerical characteristics



Achieves class-leading THD+N characteristics of –115dB

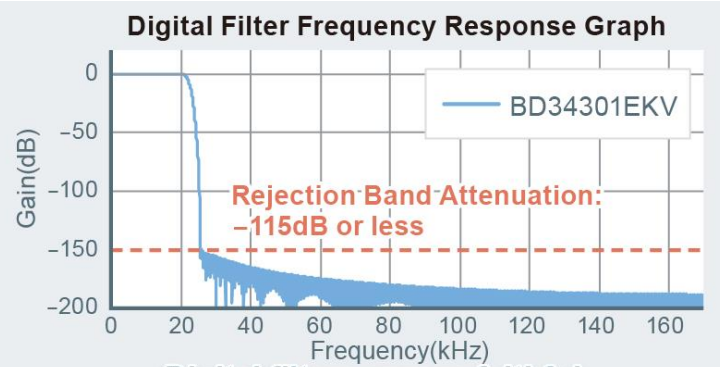
Efforts to improve sound quality performance

D/A Conversion Circuit

- **Minimizes the power supply impedance of each current segment**
- **Optimized wiring layout**
  ⇒ Reduces the clock delay (that determines the timing operation of each current segment) as much as possible

Digital Signal Processing Circuit

- **The FIR filter (a key function) is designed to faithfully process even the smallest signals**
  ⇒ Achieves a rejection band attenuation (a filter performance index) of -150dB or less



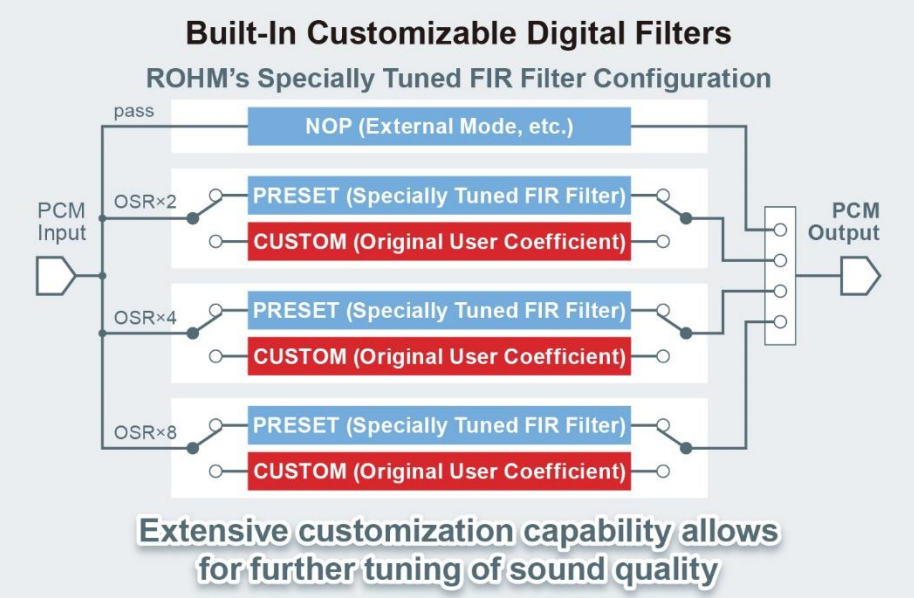
Digital filters ensure faithful processing even when <150dB

Deliver sound quality characteristics that allow one to hear elements such as ‘spatial reverberation’, ‘quietness’, and ‘dynamic range’ - important factors when listening to classical music

The BD34301EKV includes a customizable digital filter - a key feature of the digital signal processing circuit - supporting the creation of the ideal sound sought by audio equipment manufacturers

FIR Filter Specifications

- **Select from preset / custom / external settings**
- **The filter's calculation coefficients and oversampling rate can also be customized with the program function**
  ⇒ Configure unique digital filters to easily achieve different sound quality tunings for each audio device

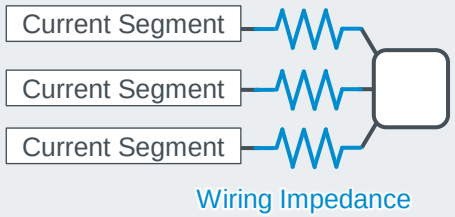


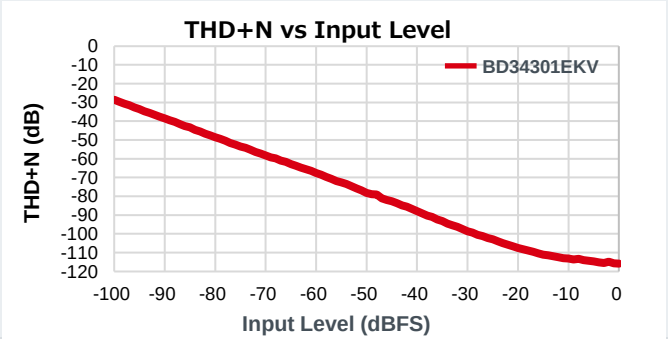
Customizable digital filters help reduce development load and create the ideal sound sought by manufacturers

Examples of Sound Quality Improvement Effects Based on Sound Quality Design Tech.

Reduce the power supply wiring impedance of each current segment as much as possible

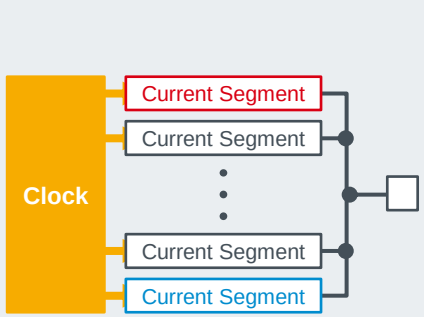
Eliminating the common impedance from each current segment to the power supply pin makes it possible to align the matching characteristics of the current segments

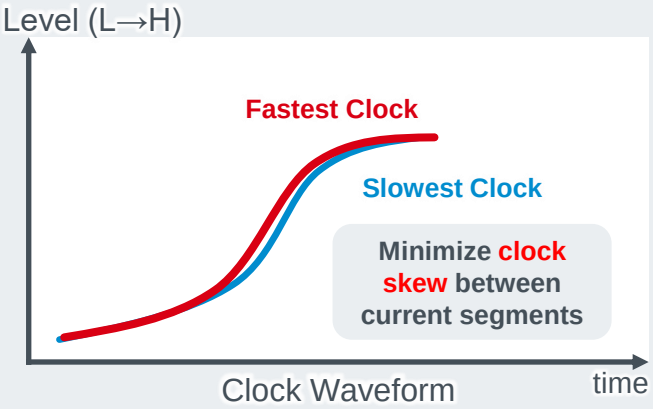




Sound quality improvement effect: Improved bass power and depth, resulting in better sound range balance

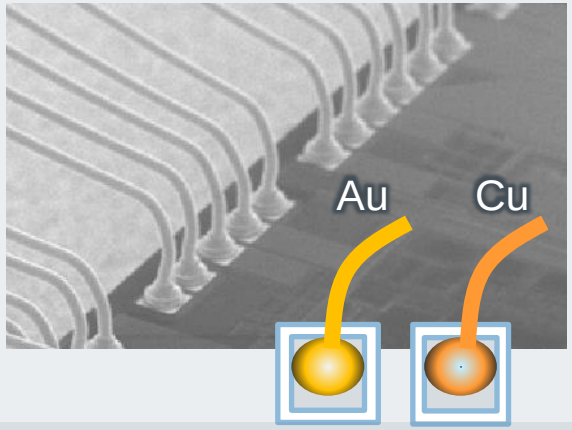
Minimize clock skew and optimize slew rate



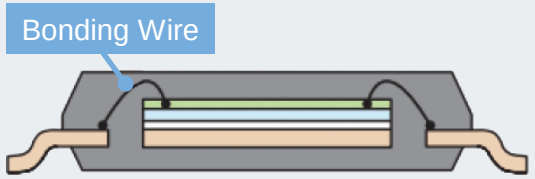


Sound quality improvement effect: Increased realism and resolution along with bass

Material of bonding wires connecting the chip to the lead frame



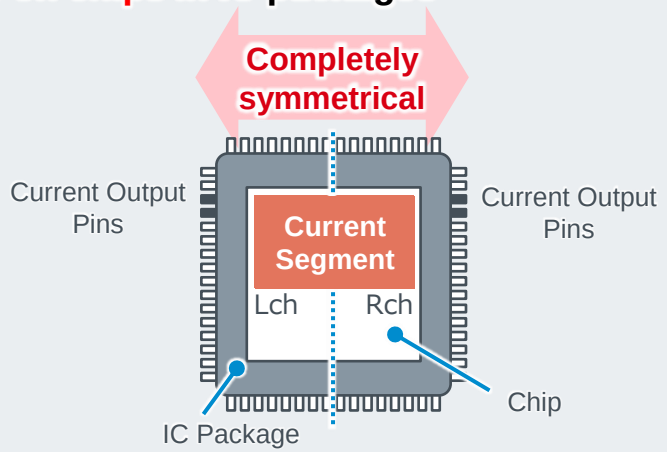
Select the best bonding wires material for the device because its material that connecting the device to the lead frame is affected the sound quality



Sound improvement effect: More natural reverberation, with a more delicate instrumental tone

Minimize stress on chips in IC packages

Select the IC package and wafer processing method that minimize stress. At the same time, adopt a completely symmetrical chip layout for the current segment circuit.



Sound improvement effect: Reduced sound peculiarities, resulting in a more natural sound

Sales Information

The BD34301EKV enables evaluation and adoption for a wide range of customer

- **Supporting documents required for evaluation are now available on ROHM's website:**
  https://www.rohm.com/products/audio-video/audio-converters/audio-dacs/bd34301ekv-product/documents
- **An evaluation board (BD34301EKV-EVK-001) is also available together with IC through online distributors**

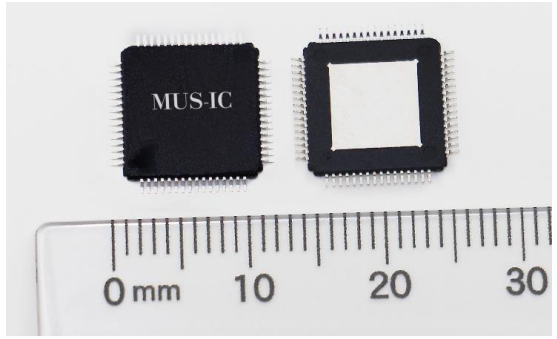
MUS-IC™ Sales

Part No: BD34301EKV

Sales Launch Date: From December 2020

Reference Price: $80.5 /pc. (excluding tax)

Production Status: In mass production

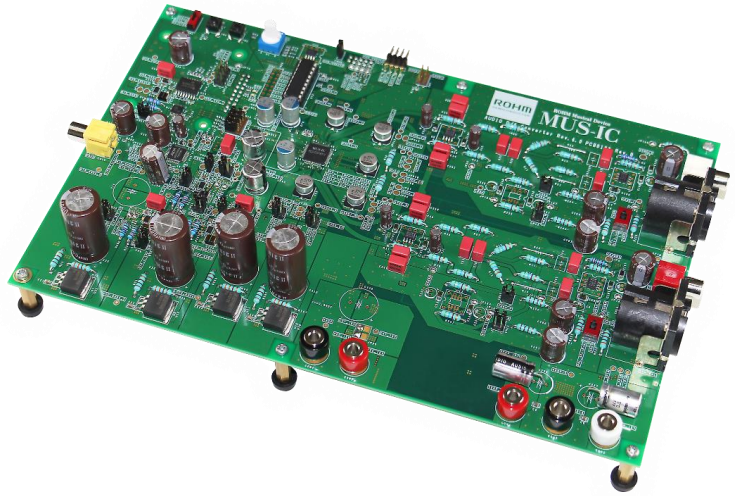


Evaluation Board Sales

Part No: BD34301EKV-EVK-001

Sales Launch Date: From February 2021

Reference Price: Please refer to each online distributor website



Online Distributors

Digi-Key ELECTRONICS | MOUSER ELECTRONICS | Farnell AN AVNET COMPANY

Electronic Components and Parts Search | DigiKey Electronics

Search results for: bd34301ekv ROHM Semiconductor – Mouser

bd34301ekv - Search Results | Farnell DE

Please consider the BD34301EKV MUS-IC™ 32bit D/A converter IC for your next design

Notes

- The content specified herein is for the purpose of introducing ROHM's products (hereinafter "Products").
- If you wish to use any such Product, please be sure to refer to the specifications, which can be obtained from ROHM upon request.
- Great care was taken in ensuring the accuracy of the information specified in this document. However, should you incur any damage arising from any inaccuracy or misprint of such information, ROHM shall bear no responsibility for such damage.
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- The content specified in this document is correct as of April 2021.