Specifications

Frequency Response: 2 Hz - 55 kHz (-0.1 dB)
Maximum Power Output: User selectable - 1000mW @ 16 Ohms, 100mW @ 16 Ohms
Maximum Output Voltage: 4.0 Vrms (high gain)
Total Harmonic Distortion (THD+N): <0.01%
Signal to Noise Ratio (SNR): >105 dB unweighted, > 108 A-weighted
Input: USB 2.0 (Asynchronous)
Outputs: Dual 1/8" (3.5mm) analog stereo (one single-ended TRS, one balanced TRRS)
Output Impedance: 0.47 Ohms (single-ended), 0.9 Ohms (balanced)
Output Stage OpAmp: Texas Instruments TPA6120A2
Amplifier Output Bias: Class A
Digital-to-Analog Converter IC: ESS SABRE9018AQ2M
USB Controller: XMOS XS1-SU01A
PCM Sample Rates Supported: 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz, 352.8 kHz, 384 kHz
DSD Sample Rates Supported: 2.8224 MHz, 3.072 MHz, 5.6448 MHz, 6.144 MHz
Bit Depth Supported: 1-bit, 16-bit, 24-bit, 32-bit
Chassis Construction: 3D printed ultra-high temp resin
Width: 37.5mm
Length: 78mm
Height: 13mm
Weight: 34 grams

Geek Out V2 Infinity:

Maximum Power Output: Additional 450mW @ 16 Ohms output selectable option
Total Harmonic Distortion (THD+N): -3dB THD+N performance boost

Limited Warranty Statement

Your new Geek Out V2 is covered by warranty to be free from defects in materials and workmanship for one year from the date of purchase. This warranty covers the cost of labor and materials for any repair deemed necessary by LH Labs. Proof of purchase or a copy of the sales receipt will be required for any claim made against the warranty, and claims are subject to the limitations and conditions outlined below.

A) Limitations and Conditions

The unit will not be covered under warranty if:

1. It has been altered or modified in any way.
2. It has been damaged due to misuse, negligence, accident, or improper operation.
3. It has been subjected to water damage, or extremes of humidity or temperature.
4. It has been purchased from an unauthorized dealer, or unauthorized repair or service has been performed.

B) Repairs and Returns

If the product is believed to be defective, a support ticket must be opened to initiate the Return Merchandise Authorization (RMA) process.

1. A RMA number must be issued by LH Labs customer service department prior to return of any product.
2. A return address and phone number must be included.
3. Returned product must include the RMA number, a written description of the defect or issue, and a photocopy of the original purchase receipt.
4. The customer is responsible for paying shipping charges to LH Labs when applicable.
5. If the product is found to be out of warranty, the customer will be given the option to pay for the repairs or replacement, or to have the product returned to them.

C) Original Purchaser

This warranty is for the sole benefit of the original Geek Out V2 purchaser, and shall not be transferable to any subsequent purchaser of the product.

This warranty statement can also be found online at: http://support.lhlabs.com

LH LABS

GEEK OUT V2

OWNER'S MANUAL & WARRANTY

GEEK OUT V2
High Performance USB DAC/Amplifier

Introduction

Congratulations on purchasing your Geek Out V2! Geek Out V2 is a high performance portable USB digital-to-analog converter (DAC) and pure Class A headphone amplifier. Geek Out V2 has multiple selectable analog gain stages that accommodate the growing headphone collections of many audiophiles. It accepts digital audio signals through USB, and outputs audio signals through two 1/8" (3.5mm) analog outputs: one TRS single-ended output (labeled SE) and one TRRS balanced output (labeled BAL).

Geek Out V2 will decode almost any music file format and resolution it receives from your connected device, up to 32/384 kHz PCM and up to 6.144 MHz DSD (DSD128).

Installation

1. Unbox Geek Out V2 and remove it from its packaging.

2. Connect Geek Out V2 to a USB port on your computer (without headphones or any other external components connected or powered on).

3. If connecting to a Mac or Linux computer, no drivers are required. If a Windows PC is being used, download and install the Light Harmonic Audio Driver which is available at http://support.lhlabs.com, along with the driver setup guide. Look in the LH Audio Driver section of http://support.lhlabs.com for both the driver and the setup guide.

***** IMPORTANT NOTE *****

The Light Harmonic Audio Driver version 2.29 will need to be installed. Older versions of the Light Harmonic Driver are not compatible with Geek Out V2.

Light Harmonic Audio Driver: http://bit.ly/lhlabsdriver

Driver Setup Guide: http: //bit.ly/lhlabsdriversetup

Configuration

In order for the computer to play sound through Geek Out V2, Geek Out V2 must be set as the default audio output device.

Windows: After installing the Light Harmonic Audio Driver and Light Harmonic Control Panel, continue to follow the steps in the Light Harmonic Audio Driver Setup Guide to set the Windows Default Sound Output to Geek Out V2.

Mac: In OS X, go to the Apple menu at the top left of the screen, and open System Preferences. Click on the Sound icon, and select Geek Out V2 as the audio output device.

*** WARNING ***

Geek Out V2 is a very powerful amplifier. Damage can occur to your ears, and to your electronics if not used properly and with care. Be sure to heed all instructions regarding connection of Geek Out V2, and turn the computer volume down prior to playback before adjusting to a comfortable listening level.

***** IMPORTANT NOTE *****

When Geek Out V2 is plugged into the computer there may be a popping sound sent through the headphone outputs. This is caused by the charging of the large power caps. This is a conscious design decision meant to improve playback quality.

Using The Geek Out V2

It is recommended that Geek Out V2 be connected/powered on for at least 10 minutes to give the components (especially the clocks) time to warm up, providing the optimal sound quality. Before you disconnect Geek Out V2, be sure to unplug headphones and/or power down the connected preamp/amp/active speakers to avoid any potential damage. LH Labs will not be held responsible for any damage to equipment due to this design implementation.

Analog Gain Stages

Geek Out V2 features multiple analog gain stages to allow for the use of multiple types of headphones. With selectable gain stages of 1000mW and 100mW (450mW also included with V2 Infinity), Geek Out V2 works equally well with high power headphones, as with highly sensitive IEMs.

The button closest to your computer when Geek Out V2 is connected to a USB port is used to select the gain. A LED beside the G marker denotes which stage is selected. A blue LED denotes 1000mW. A white LED denotes 100mW. Geek Out V2 Infinity's 450 mW gain setting is denoted by both the blue and the white LED's being lit. To help prevent any loud volume pops, every time Geek Out V2 is connected to the computer, the gain will automatically be reset to 100mW.

Volume Adjustment

Geek Out V2 has an advanced 64-bit volume control that uses an ultra-high resolution, zero noise, bit-perfect mechanism to avoid the inherent issues with previous digital volume attenuation methods and the noise associated with analog volume control. Geek Out V2's volume attenuation circuit replaces the volume calculations done by the source computer with its own, ensuring the audio remains bit-perfect through the entire conversion process.

When using Geek Out V2, volume is controlled from the computer/application audio controls. There are no hardware volume controls on Geek Out V2.

Digital Modes

Digital Modes are used to remove artifacts in the digital signal caused by the digital-to-analog conversion process and to manage digital filter settings in the internal DAC IC and clock input DPLL. Geek Out V2 offers the following filters:

TCM (Time Coherence Mode) - Uses LH Labs **minimum phase digital filter** and time optimization algorithm, which removes all PRE-ring from the converted signal and realigns the impulse response. This presents the listener with a more well-defined and natural soundstage.

FRM (Frequency Response Mode) - Uses a **slow roll-off linear digital filter** and frequency domain optimization algorithm to provide a smoother and clearer sound with even lower THD+N in the high frequencies.

SSM (Stable Streaming Mode)* - This digital mode optimizes the timing of audio being played from streaming sites such as Spotify and Tidal or any other music streaming services.

The button farthest away from your computer when Geek Out V2 is connected to a USB port is used to select the digital filter mode. A LED beside the DM marker denotes which mode is selected. The blue LED denotes TCM, the green LED denotes FRM, and the red LED denotes SSM.

*SSM is only available with Geek Out V2 Infinity and above.

LED Display

While passing digital audio signals, Geek Out V2 will display the sample rate of the track being played if the track has a sample rate greater than 48 kHz. The four LEDs and their markers denote the following when lit:

2x: 88.2/96 kHz track is being played (White)

4x: 176.4/192 kHz track is being played (White)

8x: 352.8/384 kHz track is being played (White)

DSD: DSD64/DSD128 track is being played (Blue)

Single Ended and Balanced Outputs

Geek Out V2 features two audio outputs. One 1/8" (3.5mm) TRS single-ended (labeled SE) output, as well as a 1/8" (3.5mm) TRRS balanced (labeled BAL) output. The fully balanced design of Geek Out V2 is one of the key advantages it has over other portable DACs. By incorporating a TRRS to XLR cable, Geek Out V2 can be connected to a home stereo system in full balanced mode. Do not plug in Single-ended and Balanced headphone at the same time. Do not plug in Single ended headphones into the balanced jack. Any damage caused by this will not be covered under warranty.

Operating Temperature

Geek Out V2 uses a Class A amplifier topology which inherently runs very hot. While the 3D printed chassis has been optimized to allow for greater air flow cooling, Geek Out V2 will still heat up. Its optimal temperature is between 65 and 75 degrees Celsius on PCB surface.

This heat will not damage Geek Out V2, but care should be taken if setting the device on any objects while using a USB extension cable. Take care that you do not block any ventilation holes while Geek Out V2 is in use.

Support

If there are any issues completing any of the steps in this document, understanding any of the concepts with audio playback, or with the device itself, please open a support ticket through the LH Labs support page at: http://support.lhlabs.com. A knowledge base with frequently asked questions, and an online repository of setup and user guides is available at: http://support.lhlabs.com/support/solutions