HAGERMAN
TECHNOLOGY

HagUsb

USB to S/PDIF Converter

Warnings

This product uses no lethal or dangerous voltages. However, installation into a CD player or transport can be hazardous. The instructions in this manual are a suggested guide only and Hagerman Technology LLC assumes no liability.

Copyrights & Trademarks

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Disclaimer

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1 Before You Begin

Description

Congratulations! You have just purchased one of the highest performance-per-dollar audiophile products available. The HagUsb is a high quality USB to S/PDIF converter that connects your sound system to a computer, for use as a music server. Play MP3, WAV files, CDs, etc. HagUsb can also be used standalone as a headphone amplifier.

Component quality is first-rate, and the double-sided circuit board insures quiet operation. A wide bandwidth output transformer provides electrical isolation, preventing computer-generated interference.

The HagUsb is designed to be easy to construct, with the surface mount IC pre-installed. All other components are standard through-hole types, and require no special soldering skills. The circuit board fits snuggly into the recommended plastic box, for a professional appearance.

Features

- Self-powered
- Transformer S/PDIF isolation
- Built-in headphone amplifier
- Plastic enclosure

Tools

This is a kit product and only skilled electronic technicians should attempt construction and installation. You will need an array of shop tools and a good soldering iron.

2 Parts to Buy

Kit

If you purchased a factory assembled HagUsb, skip to Chapter 4. It is recommended you read this entire manual before starting.

Parts List

Parts should be ordered directly from **www.digikey.com**.

Component	Qty	DigiKey	References
100uF 6V	4	P10195	C6, C10, C11, C12
1uF	10*	BC1168CT	C7, C1, C2, C3, C4, C5
10nF film	2	495-1097	C13, C14
33pF	1	P4843	C8
47pF	1	P4845	C9
Crystal 12MHz	1	X1037	Y1
Bead, ferrite	1	240-2492	L1
LED	1	160-1142-ND	D1
Transformer	1	470-1006	T1
USB jack	1	151-1081	J1
RCA jack	1	CP-1423	J2
Phone jack	1	CP-3554NG	J3
Box	1	HM355	
USB cable	1	AE9932	
22 1/8W	5*	22EBK	R3, R4, R8, R10
110 1/8W	5*	110EBK	R7
220 1/8W	5*	220EBK	R5
470 1/8W	5*	470EBK	R12
1.5k 1/8W	5*	1.5KEBK	R1, R2, R9, R11
1M 1/8W	5*	1.0MEBK	R6

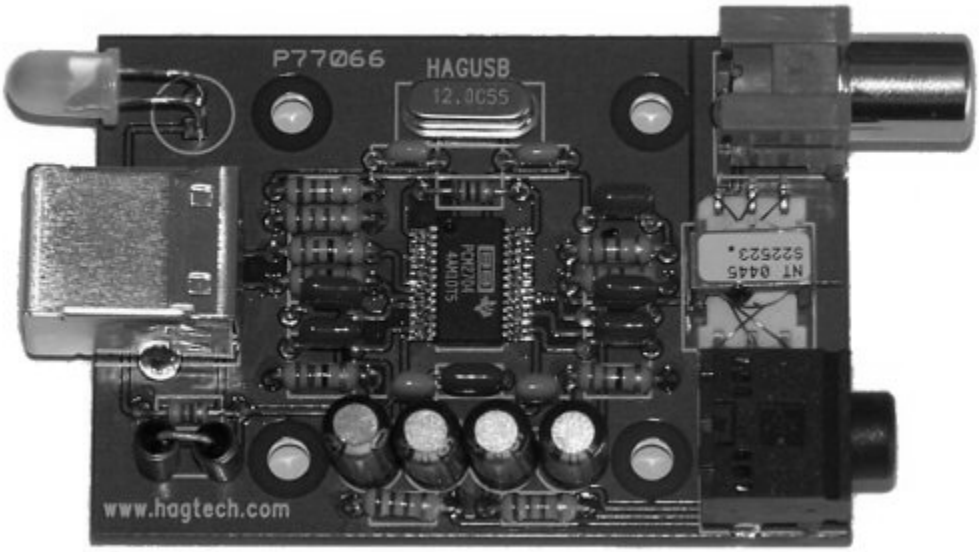
* Minimum purchased quantity.

3 Assembly & Test

Circuit Board

Assemble in the following order, solder and clip leads before continuing.

- Install all resistors.
- Install small capacitors.
- Install ferrite bead.
- Install crystal.
- Install transformer. Insure pin 1 dot is rotated correctly.
- Install headphone, RCA, and USB jacks. The headphone jack has one extra pin, clip it off.
- Install electrolytic capacitors. Negative lead towards outside.
- Install LED with about 3/8" lead length. Bend it over to face outwards. Square hole is positive (anode).

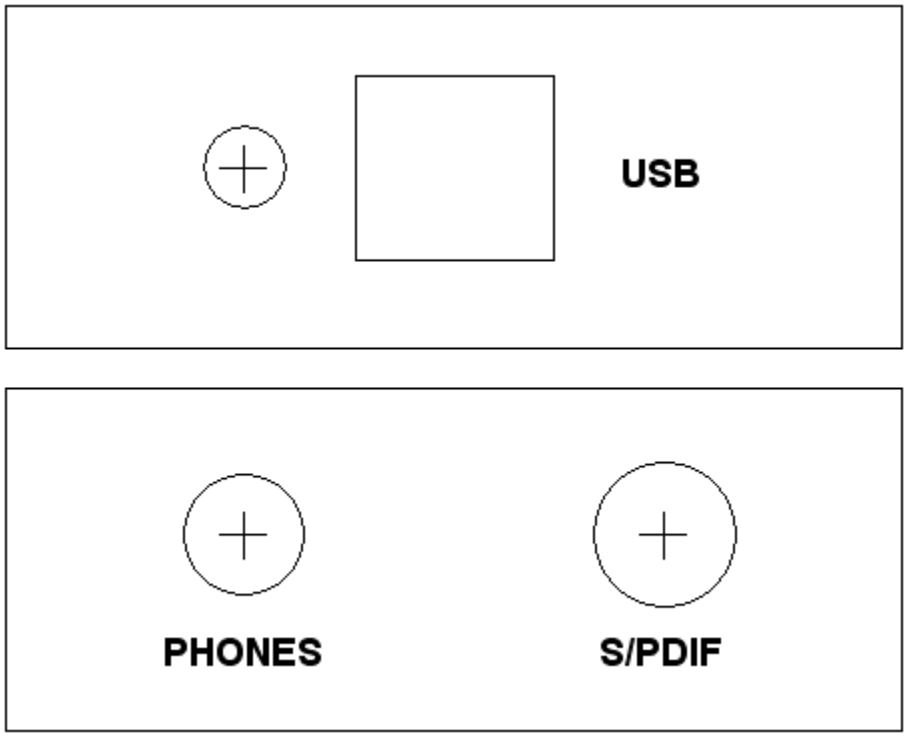


HagUsb circuit board.

Chassis

The chassis faceplates need to be machined to accommodate the connectors.

- Follow the guides to drill out holes and the rectangle. Use a file to clean up edges.
- Install faceplates on circuit board and insert into the bottom chassis piece. Use four #4-40 x 3/16" screws to secure in place.
- Add cover.



Faceplate guides.

4 Testing

Installation

The HagUsb plugs into your computer via a standard USB cable. The bus itself supplies power, and the LED should light up immediately. After a few seconds, the operating system (XP or OS-X) will recognize and enumerate the new device, configuring it as the new audio output port. All computer sounds will then be routed to the HagUsb.

Connect standard headphones and try playing a CD. Volume is controlled by software, so make sure it is not muted. If using the S/PDIF output, connect via a quality 75-ohm coaxial cable to your DAC. If you experience difficulties, contact the factory for help.

5 Specifications

The following specifications are subject to change without notice.

Item	Specification
Input	USB 1.1
Audio Data Rates	32kHz, 44.1kHz, 48kHz
Output Impedance	75 ohm (S/PDIF)
Headphone Load	32 ohms
S/PDIF Amplitude	0.5Vpp (75 ohm termination)

6 Warranty & Service

Warranty

Hagerman Technology LLC warrants this product free of defects in materials and workmanship for 10 years. If you discover a defect, Hagerman Technology LLC will, at its option, repair or replace the product at no charge to you provided you return it during the warranty period, transportation charges prepaid to Hagerman Technology LLC. This warranty does not apply if the product has been damaged by negligence, accident, abuse or misuse or misapplication, has been damaged because it has been improperly connected to other equipment or has been modified without the express written permission of Hagerman Technology LLC. This warranty is limited to the replacement or repair of this product and not to damage to equipment of other manufacturers.

Any applicable implied warranties, including warranty of merchantability, are limited in duration to a period of the express warranty as provided herein beginning with the original date of purchase and no warranties, whether express or implied shall apply to the product thereafter.

Under no circumstances shall Hagerman Technology LLC be liable for any loss, direct, indirect, incidental, special, or consequential damage arising out of or in connection with the use of this product.

Service

Refer to Chapter 4 for troubleshooting information. If the problem persists, contact Hagerman Technology for service at **www.hagtech.com**.

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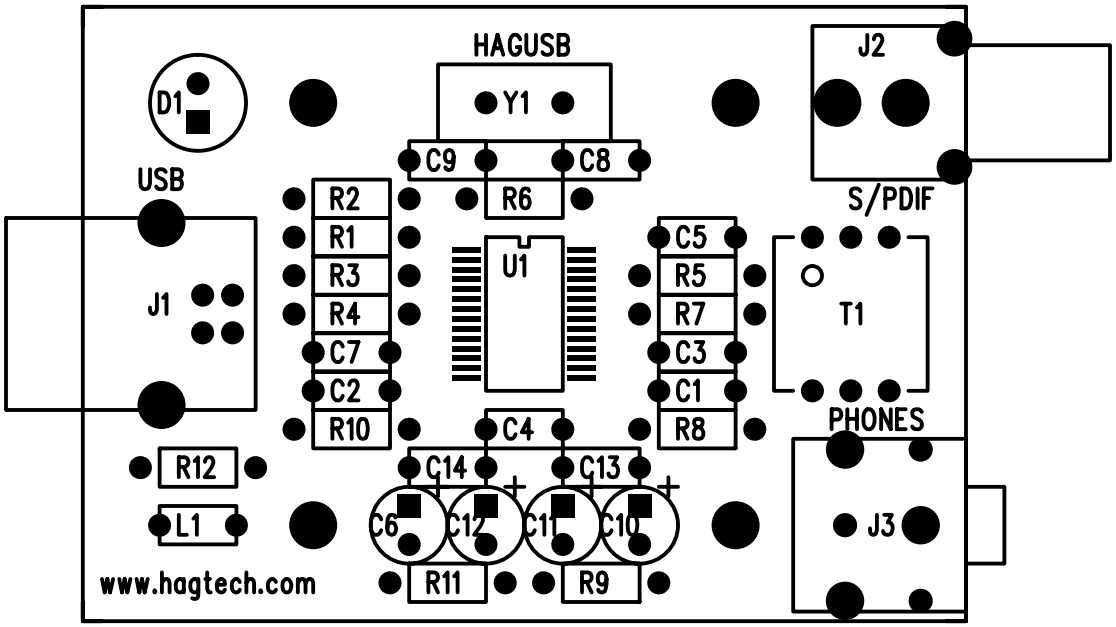
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J2
D1
Y1
C9
C8
USB
R2
R6
S/PDIF
R1
U1
C5
J1
R3
R5
T1
R4
R7
C7
C3
C2
C1
R10
C4
R8
PHONES
R12
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C13
L1
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R11
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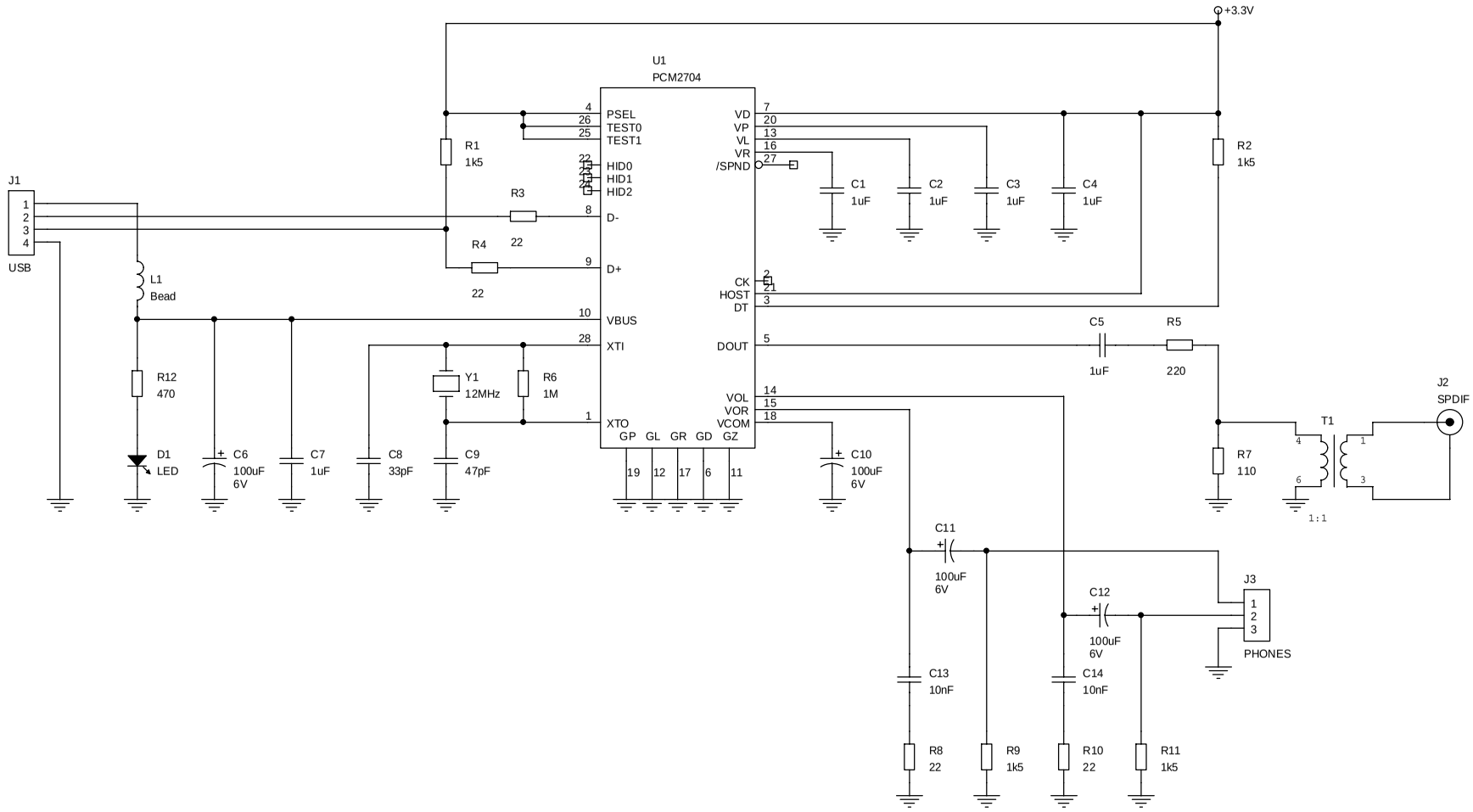

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