

TEST OF HYPEX AMPLIFIER

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Versatile modules have many uses

For those who want to build their own power amplifiers, there are now several ready-made amplifier modules on the market. The Hypex UCD700AD is among the most powerful choices available. HIFI Magazine has tested a pair of mono amplifiers based on these modules.

Hypex is located in Holland and the company is well-known in circles of HiFi enthusiasts thanks to its amplifier modules, which are intended for driving subwoofers and active loudspeakers. All of the company's products are designed and manufactured in Europe. This may be considered an unusual strategy, given that so many products are nowadays manufactured in China.

Hypex is following the current trend regarding digitalization and its product range is indicative of this trend as well. Hypex names its new amplifier technology UCD, short for Universal Class D. This technique has been developed by Philips and is now used by Hypex under license.

UCD modules are available in three power categories. The type numbers 180, 400 and 700 indicate the power available in watts. All modules have been designed using discrete components and have overcurrent and overvoltage protection.

Assembly and enclosure

The mono amplifier (our demo unit came preassembled by the importer) is some sort of a jig-saw puzzle, consisting of the UCD700AD module, UCD700PS power supply module, mains transformers, power switches, LED diode, wires, connectors and enclosure. Consumers are offered only the kit version. One module costs 310 € and together with the power supply the price of one complete mono amplifier is approximately 700 €.

The module is balanced and the demo unit has XLR-type input connectors. However, all measurements and listening tests were performed using the RCA-XLR adapter cables supplied with the demo unit.

The most striking detail when taking a glimpse inside the unit are the toroidal transformers, of which both mono amplifiers have two. The amplifier module itself is located at the back corner of the enclosure close to the connectors. The dimensions of the enclosure are 130 x 79 x 40 mm.

Hypex recommends its UCD700 based amplifier solutions both for home HiFi enthusiasts as well as for studio and PA-system applications. That should be no problem. The unit is specified as delivering 700 W of power and low distortion figures. This indicates ample performance, just like the insensitivity to load and good signal-to-noise ratio values. Neither has Hypex forgotten those audiophiles with golden ears. According to the manufacturer, amplifier constructions based on the module have been compared side by side with even Class A amplifiers and SET amplifiers with encouraging results.

Impeccable operation with some minor critiques

The measured performance of the amplifier left practically no room for critique. The power output is within the limits promised by the manufacturer, even though the available output power halves into a 2-ohm load compared to what is delivered into 4 ohms. The frequency response is ruler-flat and both the signal-to-noise ratio and harmonic distortion measurements are good. Input and output impedances allow connection to many different kinds of equipment without problems.

The amplifiers were compared in the listening room to a reference amplifier (Accuphase E-405). In the listening tests the amplifiers performed quite well with massive music. A certain type of clarity and a feel of control which could not be disturbed very easily. The sound comes across as very pure and neutral, albeit a tad "clinical" and lacking in character. With more sensitive music, the color palette seemed a bit hard and the sound could have been better fleshed out.

The most natural use for this hobbyists and self assemblers kit is probably in applications with a need for large output power and pure sound. In this niche the most powerful version of the UCD series seems to be a very noteworthy choice. The assembly itself seems easy enough even for those kit builders who have little experience. The possibility to build the amplifier into a self designed enclosure might also appeal to many HiFi enthusiasts. The compact size and the conservative energy consumption compared to output power speak in favor of the module.

Listening Results

8,3 [on a scale of 10] - Clearly sterile

Open and clear sound. At best even clarity which might be defined as airiness can be experienced. This accuracy has not been achieved without costs, because at times a certain hardness in the color of the sounds was experienced, the response can hardly be described as too juicy. Studio based rhythm music sounds ok and the base has power and can be followed easily. Live session recordings could be a bit more juicy. On the other hand, when listening to massive classic music, the demo unit makes the reference amplifier seem a bit stuffy. The treble is reproduced quite nicely without the chirpiness sometimes heard when listening to the same kind of music on high-definition type of equipment. The stereo separation might be of a technical sort since with more sensitive music the amplifier pair sounds a bit barren and rough. All in all a quite reasonable choice and in rougher use even a bit more than reasonable.

Image texts

The mains transformers and the filter capacitors fulfill most of the mono amplifiers enclosure.

700 W are fitted onto a quite small card when utilizing class D.

Input, output, on/off, the most basic sort of back panel.

SIDEBAR

Text Risto Niska

How a UCD amplifier works

A Class D amplifier operates like a high powered one bit DA-converter. The sound signal is first converted into a corresponding pulse train, in which positive and negative phases appear concurrently in a way so that their mean ratio between them corresponds to the voltage value of the analog sound signal.

The pulse train is converted from the digital sound signal using digital signal processing. In some cases (with SACD DSD coding) the digital audio is already as one-bit pulse train, which in theory is ready as it is for controlling the amplifier. From an analog signal the pulse train may be formed directly using a voltage comparator in which case the reference voltage used is a saw or triangle waveform signal. In this way one gets a pulse width modulated (PWM) one-bit digital signal.

The frequency of the pulse train is always much higher than the highest perceivable frequency, typically hundreds of kilohertz, so that it may be converted into an analog signal at the output of the amplifier with the help of a simple passive low pass filter.

The advantage of a Class D amplifier as compared to a linear amplifier is its better efficiency, which means that smaller amounts of wasted heat energy is formed. Due to this, a Class D type amplifier can in most cases be installed in a dimensionally smaller enclosure than traditional type amplifiers with comparable power rating. The most notable weak points in Class D type amplifiers are a relatively large output impedance and strong high-frequency noise signals.

The Hypex USD amplifier differs from most other Class D amplifiers in that negative feedback is utilized. In this way the output impedance of the amplifier could be made smaller and by that the frequency response is more straight regardless of changes in loudspeaker impedance. Also distortion will be smaller.

Price approximately 700 € / channel

Hypex UCD700AD

For more information: Hifitalo, tel. +358 (0)208 333 030, www.hifitalo.fi, www.hypex.nl

Dimensions: 25,4 x 8 x 36,5 cm

Weight: 8 kg

Measurement results

Frequency range	pa061211.eps [image curve]
Output power/channel	145/235 W
-- continous 8/4 ohm	420/675 W
-- 20 ms, react., 8/4/2 ohm	420/785/270 W
15 kHz damping with 5 kohm input impedance	0,1 dB
SNR-ratio, 10 W, CCIR/ARM	110 dB
Sensitivity, 1 kHz	2,9 V
Input impedance	approximately 100 kohm
Speaker output impedance, 8/6 ohm	0,04 ohmia
Harmonic distortion, 1 kHz, 0,1/1/10 W	0,002/0,003/0,009 %
Power consumption	

-- quiescent 38 W
-- 10 W/channel output power 55 W

Evaluation of measured values

Insensitive to loads

Despite its digital type circuitry the frequency range of the Hypex amplifier is in practice independent of the impedance of the loudspeakers. Output power is available in more than ample amounts into 8 and 4 ohm loads. In case of 2 ohm loads the output power remains relatively low.

The clock frequency of the digitizing function is approximately 400 kHz and the frequency range of the amplifier extends to almost two hundred kilohertz. Based on the power consumption the efficiency of the amplifier at low output power levels is rather low despite it being digital and is actually worse than with most linear amplifiers.

The measurement results are overall unimpeachable. The output impedance is exceptionally low when taking into account the selected approach with the design.

Risto Niska

CONNECTORS

input, RCA/XLR	-/1
line output	-
loudspeakers	1
headphones	-